

1991-~~03~~⁰³-~~93~~⁹³-0A ~~FEA~~ ~~for~~ *Platt Field Family Housing at*
FILE COPY *MCAB*

Report Control Symbol: DD-6280-04

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY SUPPORT COMMAND, HAWAII
FORT SHAFTER, HAWAII 96858-5000

ENVIRONMENTAL ASSESSMENT
FOR
FY91, PN OCS0090 SECTION 802 (RENTAL GUARANTEE)
FAMILY HOUSING PROJECT AT PLATT FIELD,
MARINE CORPS AIR STATION KANEOHE BAY,
CITY AND COUNTY OF HONOLULU, HAWAII

PREPARED FOR THE PROPONENT BY:

SUBMITTED BY THE PROPONENT:

Donald T. Wynn *19 Dec 90*
DONALD T. WYNN DATE
Lieutenant Colonel, CE
Commander
U.S. Army Engineer District
Honolulu

Michael Ward *21 Dec '90*
MICHAEL WARD DATE
Colonel, CE
Director, Oahu Consolidated
Family Housing Office
U.S. Army Support Command, Hawaii

REVIEWED AND APPROVED BY:

R.R. Critser *3-11-91*
R.R. CRITSER DATE
Colonel, USMC
Commanding,
MCAS, Kaneohe Bay, Hawaii

End 1

ENVIRONMENTAL ASSESSMENT (EA) FOR
FY91 PN OCS 00090 SECTION 802 (RENTAL GUARANTEE)
FAMILY HOUSING PROJECT AT PLATT FIELD,
MARINE CORPS AIR STATION KANEHOE BAY,
CITY AND COUNTY OF HONOLULU, HAWAII

Lead Agency: Oahu Consolidated Family Housing Office
U.S. Army Support Command, Hawaii
Fort Shafter, HI 96858-5000

Preparing Agency: U.S. Army Corps of Engineers, Honolulu
Engineer District
Building 230, Fort Shafter, HI 96858-5440

EA Preparer and Agency POC: Mr. David G. Sox, Social-Environmental Spec
Telephone (808) 438-5030/1776
MA, Geography, University of Hawaii (1972)
15 years experience preparing water resources
& military project EAs & EISs, U.S. Army
Corps of Engineers, Pacific Ocean Division.

EA Contributor: Mr. Farley Watanabe, Archaeologist
BA, Anthropology, University of Hawaii (1972)
16 yrs Professional Archaeology
5 yrs experience performing archaeological
studies, U.S. Army Corps of Engineers,
Pacific Ocean Division

Approving Agency: U.S. Marine Corps
Marine Corps Air Station, Kaneohe Bay (MCASKB),
Hawaii 96863-5001
POC: Diane Drigot, Ph.D., Environmental
Protection Specialist
Telephone (808) 257-2175

Abstract: The Proposed Action is to construct 276 family housing units for military service members and their families at a 24-acre site at Platt Field in the middle of Marine Corps Air Station, Kaneohe Bay (MCASKB), Hawaii. Alternatives include no action, three different housing schemes (depending on the number of units desired) at Platt Field, and two schemes at Fort Hase Beach at the eastern edge of MCASKB. Consideration was given for siting the proposed family housing at nearby Bellows Air Force Station. A separate project will upgrade portions of the Station's off-site sewer system that would be impacted by the proposed housing project.

The proposed action at MCASKB would have no effect on drinking water aquifers or other water resources; endangered species of plants or animals; or wetlands or special aquatic sites, or other important ecological areas, including the Nu'upia Ponds Wildlife Management Area. However, some of the open space and grassy areas at MCASKB, which are now used as wintering grounds for Golden

plovers, a Federally protected migratory bird, will be diminished. Drainage studies indicate that even with proposed FY91 Station improvements to Mokapu [Drainage] Canal, about 1/2 acre of the proposed housing site would be flooded under a 100-year storm. Measures including fill and/or structural flood proofing will be implemented in this affect area. The separate FY91 drainage improvement project must also be implemented. A pre-construction archaeological survey indicates that the proposed housing project is not expected to affect any subsurface prehistoric cultural resources that are listed or likely eligible for listing in the * National Register of Historic Places. A preliminary determination of no effect has been sent to the State Historic Preservation Officer per Section 106 of the National Historic Preservation Act (NHPA). *

There are two abandoned, underground, gasoline tanks immediately adjacent to housing site's southeast corner. An investigation indicates that there is no ground water contamination and a minimal quantity of petroleum hydrocarbon contamination in the surrounding soil proximate to one of these tanks. The housing site has been configured to avoid the tank area. Federal regulations require the Station to close the tanks. Prior to closure, further study will determine the extent of soil contamination, make a risk assessment, and recommend a method of tank closure. The preliminary report from the recently completed field investigation indicates only minimal remediation will be needed at time of closure, to include removal of contaminated soil and the tanks themselves. The timing of tank closure is subject to availability of funds, and may be accomplished before or after occupancy of the housing project.

Four softball fields and a football/soccer field will be displaced to the general vicinity of Fort Hase Beach. The on-station, State-operated Mokapu Elementary School is already inadequate to accommodate the existing elementary-school aged children; new students will need to be bused to schools in local communities. There are adequate water and communications connections, but a new primary feeder from a nearby electrical substation is needed. The MCASKB sewage treatment plant has sufficient treatment capacity, but, as a separate project, sections of the collection system will be upgraded to accommodate the additional wastewater. The * Government will review the sewer line trenching excavation plan and comply with Section 106 of the NHPA, including monitoring if needed. *

A Finding of No Significant Impact is recommended.

TABLE OF CONTENTS

<u>Para No.</u>	<u>Subject</u>	<u>Page</u>
	Title/Signature Page	i
	EA Preparers/Abstract	ii
	Table of Contents	iv
	SUMMARY	1
1.	PURPOSE AND NEED FOR ACTION	
1.1	Purpose	6
1.2	Need	6
	Oahu-wide Housing Demand	
	Current Demand in Kaneohe Bay Region	
	Projected Housing Demand in MCAS Kaneohe Bay Region	
	Effects of Living Off-Station	
2.	ALTERNATIVES INCLUDING THE PROPOSED ACTION	
2.1	Proposed Action	8
2.2	No Action	9
2.3	Fort Hase Beach Site	9
2.4	Bellows Air Force Station Site	10
2.5	Comparison of Alternative Sites	11
3.	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	
3.1	Introduction	12
3.2	Regional Setting	13
3.3	Station History and Mission	13
3.4	Site Description	14
3.5	Climate and Air Quality	14
	Existing Conditions	
	Environmental Consequences	
	Measures to Avoid or Mitigate Adverse Impacts	
3.6	Geology, Soils and Hydrology/Drainage	15
	Existing Conditions	
	GEOLOGY	
	SOILS	
	HYDROLOGY/DRAINAGE (FLOODPLAIN ANALYSIS)	
	Environmental Consequences	
	SOILS	
	GROUND WATER	
	FLOODING	
	E.O. 11988 FLOODPLAIN ANALYSIS	
	Measures to Avoid or Mitigate Adverse Impacts	

TABLE OF CONTENTS

<u>Para No.</u>	<u>Subject</u>	<u>Page</u>
3.7	Biological Resources Existing Conditions PLATT FIELD OFF-SITE CONDITIONS Environmental Consequences PLATT FIELD OFF-SITE IMPACTS Measures to Avoid or Mitigate Adverse Impacts	18
3.8	Historic Sites Existing Conditions Environmental Consequences Measures to Avoid or Mitigate Adverse Impacts	21
3.9	Socio-Economic Factors Existing Conditions Environmental Consequences Measures to Avoid or Mitigate Adverse Impacts	22
3.10	Recreation and Visual Resources Existing Conditions Environmental Consequences Measures to Avoid or Mitigate Adverse Impacts	24
3.11	Transportation Factors Existing Conditions Environmental Consequences Measures to Avoid or Mitigate Adverse Impacts	25
3.12	Safety and Health Factors Existing Conditions INTRODUCTION AIRCRAFT NOISE EXPLOSIVES FLOODING HAZARDOUS OR TOXIC MATERIALS Environmental Consequences SHORT-TERM CONSTRUCTION IMPACTS AIRCRAFT NOISE AND EXPLOSIVES HAZARDOUS OR TOXIC MATERIALS Measures to Avoid or Mitigate Adverse Impacts	26
3.13	Utilities Existing Conditions WATER SEWAGE Environmental Consequences WATER SEWAGE	29

TABLE OF CONTENTS

<u>Para No.</u>	<u>Subject</u>	<u>Page</u>
3.13	Utilities (Cont'd) Measures to Avoid or Mitigate Adverse Impacts	
3.14	Land Use Plans and Policies Existing Conditions Environmental Consequences Measures to Avoid or Mitigate Adverse Impacts	31
3.15	Energy Requirements and Conservation Potentials of Various Alternatives and Mitigation Measures	32
3.16	Any Irreversible and Irretrievable Commitments of Resources Associated with the Proposed Action	32
3.17	Relationship between Local, Short-term Use of the Human Environment, and the Maintenance and Enhancement of Long-term Productivity	32
3.18	Urban Quality, Historic and Cultural Resources, and Design of the Urban Environment, including Reuse and Conservation Potential of Various Alternatives	32
3.19	Any Probable Adverse Environmental Effects which Cannot be Avoided Should the Proposal be Implemented.	33
4.	CONCLUSION	33
5.	LIST OF REFERENCES, PERSONS, AND AGENCIES CONSULTED	
5.1	List of References	34
5.2	List of Persons or Agencies	36
Appendix A	COORDINATION LETTERS	
Appendix B	ECONOMIC IMPACT FORECAST MODEL	
TABLES		
1.	Comparison of Alternatives	11

ILLUSTRATIONS

Maps and Figures

1. Regional Map
2. Alternative Sites at Marine Corps Air Station Kaneohe Bay,
Including Alignment of Mokapu Canal and
Nu'upia Ponds Wildlife Management Area
3. Proposed Alternative at Platt Field,
Including Abandoned Underground Gasoline Tanks
4. Conceptual Cross-Section of Proposed Alternative
5. Scheme 1 at Platt Field
6. Scheme 2 at Platt Field
7. Scheme 1 at Fort Hase Beach
8. Scheme 2 at Fort Hase Beach
9. Conceptual Cross-Section of Fort Hase Alternatives
10. Alternative Site at Bellows Air Force Station
11. General Plan of Fort Hase, 1945
12. 100-Year Flood Outline (Existing and Future Conditions)
13. Station Historic Properties, MCAS Kaneohe Bay, Hawaii
14. Aircraft Noise Levels, MCAS Kaneohe Bay

Photographs

1. Southeastward View Across Platt Field to Building 1088
2. Northwestward View Across Platt Field to Youth Center
3. Northwestward View Across Platt Field to Obstacle Course
4. Northeastward View From Platt Field Toward Cushman Avenue
5. Eastward View Toward Building 1282; Location of Abandoned,
Underground Gasoline Fuel Tanks

SUMMARY

Introduction

This environmental assessment (EA) was prepared to comply with Section 102(c) of the National Environmental Policy Act (NEPA) of 1969, and in accordance with the administrative requirements of Army Regulation (AR) 200-2 (32 CFR Part 651) and Marine Corps Order (MCO) P11000.8B (1983). An EA was prepared for the proposed project in accordance with the requirements of Paragraph 3110.3 of MCO P11000.8B and AR 200-2 "to determine the extent of environmental impacts of a project and decide whether or not those impacts are significant." As required by Paragraph 651.29 of AR 200-2, an Environmental Impact Statement (EIS) is required if certain environmental resources are significantly affected or other specific criteria are met. This EA complies with the Environmental Baseline Survey (EBS) Protocol, as required by Paragraph 12-5 of AR 200-1 (23 April 1990) for real property transactions.

Purpose and Need

On the island of Oahu, Hawaii, adequate housing is scarce and unaffordable for many enlisted and company grade officers and their families. For military personnel assigned to the Marine Corps Air Station, Kaneohe Bay (MCASKB) (also referred to here as the "Station"), it is often available only at considerable commuting distance. Demand for non-military public housing is high, and the rental vacancy rate is the lowest in the Nation at about 1.2 percent, compared with the national average of about 5 percent. The purpose of this housing project is to provide affordable, on-station family housing which will also reduce commute time between home and duty station, increase response time in an emergency, and raise morale.

Proposed Action

The proposed project would provide 276 family housing quarters. The project would be located on Platt, Joe E. Brown, and Coleman Fields (hereinafter designated "Platt Field") at MCASKB. Platt Field is a 24-acre site consisting of a parade ground, an obstacle course, and ball fields. It is adjacent to Mokapu Elementary School. All of the proposed dwelling units will be 2-bedroom units, configured to multiple-unit townhouses/apartments. Supporting facilities will consist of all utilities and communications, roadways and walkways, tot lots, landscaping, and street lighting.

As authorized under Section 802 of the FY 1984 Military Construction Authorization Act, as amended (10 U.S.C. 2821 note), the proposed housing will be financed by a private developer through a competitively-negotiated solicitation. The developer will design and build new housing on Federal Government land at the developer's expense, and will rent the housing on a priority basis

to military personnel. The developer will be provided a Federal guarantee of 97 percent occupancy of the units at rates affordable to military families, for an initial period of 25 years.

* Separately from the Section 802 project, the Government will award a contract for upgrading portions of the Station sewer line outside the proposed housing site which would be impacted by the housing project. The segments of the sewer line proposed for upgrading by providing greater diameter pipes are depicted on Figure 3. *

Alternatives and their Impacts

Alternatives to the Proposed Action include no action, two different housing schemes (depending on the number of units desired) at Platt Field, two schemes at Fort Hase Beach at the eastern edge of MCASKB, and consideration of a site at nearby Bellows Air Force Station. The No Action alternative would not meet the objective of the project to provide affordable and convenient housing on Station.

Two alternative housing schemes have developed at the Fort Hase Beach site for 122 or 160 dwelling units. The site's proximity to the ocean (Kailua Bay) would place over half of its units at risk of inundation from a 100-year storm-generated coastal wave/flood. The area would be subject to tsunami damage. The at-risk units would be raised with vehicular parking and other non-inhabited uses on the ground floor. This Alternative would aggravate an existing night-time light disorientation problem that young fledgling Wedgetailed Shearwater shore birds experience, often resulting in the birds injuring themselves by falling into residences and backyards. Any subsurface excavations would most likely have adverse impacts on prehistoric cultural resources. The lower half of the site lies within a prehistoric Hawaiian archaeological site, which is part of the larger Nu'upia Ponds, a fishpond complex, that is eligible for listing in the National Register of Historic Places. The larger of the two schemes would displace two outdoor recreational facilities. The distance of the Fort Hase Beach site from suitable utility connections would require expensive utility upgrades for electrical power and wastewater conveyance. Housing there would not displace any formal recreational facilities. The Fort Hase Beach alternative site's cost, safety, and environmental disadvantages appear to outweighed its advantages.

The housing site at Bellows Air Force Station (BAFS) would be located in the northwestern corner of the installation. Because of occasional week-day maneuvers in the area by the Marines, likely destruction of the subsurface archaeological artifacts, and costly sewage collection and treatment, the 15th Air Base Wing has not approved the site for housing.

Environmental Impacts and Mitigation Measures

Impacts of the three alternative housing schemes at Platt Field would be similar to each other.

Drainage studies indicate that about 1.4 acres at the northwest side of the proposed site would be flooded under a 100-year storm (no more than 1 percent chance of occurring in any one year). Even with a proposed FY91 Station improvements to Mokapu [Drainage] Canal, a 1/2 acre portion of that area would still be flooded. Nevertheless, the proposed housing will not further aggravate the current off-site potential flood hazard area. Avoidance measures, including fill and/or structural flood proofing, will be implemented in the affected area. The area affected by the avoidance measures might need to be larger if the separate, Station-funded FY91 drainage improvement project is not implemented on schedule. A brief Executive Order 11988 Flood Plain Evaluation is contained in the EA.

Platt Field alternatives would have no effect on endangered species of plants or animals; wetlands, special aquatic sites, or other important ecological areas; or drinking water aquifers or other water resources. The entire housing site is a mowed-grassed recreational area. All kiawe trees west of Cushman Avenue and elsewhere will be retained if possible. Stormwater runoff will not differ substantially from existing flows from other developed lands in the drainage basin; therefore, based on previous studies, the housing project runoff will not adversely affect the habitat for four federally-listed endangered birds in the Nu'upia Ponds Wildlife Management Area.

An analysis of historical and archaeological documents initially indicated the likely presence of subsurface prehistoric (pre-AD 1800) Hawaiian historic fishery or dry land agricultural remains at Platt Field. The field portion of a pre-construction archaeological survey, including the excavation of 32 trenches, has been completed. A separate soil survey found that a layer of fill * material covers much of the site. That information, combined with the archaeological findings, indicates that no subsurface cultural materials are present. A preliminary determination of no effect has been sent to the State Historic Preservation Officer (SHPO) in compliance with Section 106 of the National Historic Preservation Act. That letter and the Hpo's preliminary concurrence are included in Appendix A. The draft and final archaeological survey reports will be coordinated with the SHPO later to obtain a formal concurrence of no effect.

The separate project of replacing existing sewer lines with larger diameter pipes could require the old utility trenches to be excavated wider and thus could uncover previously undisturbed subsurface cultural materials. Once excavations plans are made available to the Government, a determination of effect will be coordinated with the SHPO. If needed, archaeological monitoring of * trenching excavations will be performed.

The on-station, State-operated Mokapu Elementary School, in grades K-8, is already operating at full capacity. Many elementary-school aged children are bused to off-station schools in the Kailua-Kaneohe region. A State-funded classroom project will soon eliminate most of the current deficit of space, but the future project's children will again need to be bused off station. The proposed project has been coordinated with the State of Hawaii Department of Education. The economic impact of Federally supported students on local public schools is mitigated by an existing Federal program that subsidizes the State Department of Education on a per pupil basis.

Using a U.S. Army economic impact forecast model, it is projected that construction of the proposed 276 unit housing project will generate direct economic benefits worth over \$7.9 million in sales volume and induced benefits worth over \$10.75 million in sales volume. About 93 direct jobs will be generated and another 337 will be induced or supported. The movement of 276 military families from private sector housing will free up about 177 rental units and 99 owner-occupied units on Oahu.

Each of the Platt Field alternatives would displace four softball fields and equipment and a football/soccer field with goal poles. These popular facilities are centrally located in the midst of existing family housing quarters, and are immediately adjacent to Mokapu Elementary School, a newly completed Youth Center, and several picnic tables. To mitigate for the loss of the facilities at Platt Field, the Station will place the outdoor sports facilities elsewhere on Station, probably in the general vicinity of the Fort Hase Beach area. This mitigation action would adversely affect users nearby the present site, but will benefit others now more distant from the Platt Field area. The 3rd Marine Regiment's Obstacle Course would also be displaced to another location.

There will be no project impacts on traffic flow, except during construction of the improvements to sewer pipelines which pass * across and parallel to certain Station roads. Transportation of construction materials, possibly including prefabricated housing parts, could cause short-term traffic congestion, particularly passing through Wilson Tunnel on the Likelike Highway from Honolulu Harbor to Kaneohe. *

There are adequate water and communications connections, but a new primary feeder from a nearby electrical substation will be needed. The MCASKB sewage treatment plant has sufficient treatment capacity. However, three sections of the collection pipeline system will need to be upgraded to accommodate the additional wastewater to avoid surcharging (overflowing), which would occur only during the wet weather peak flow and under the assumption of a maximum Station population. Two additional sections that already have the potential to surcharge without the proposed project should also be improved.

Immediately adjacent to the southeast corner of the proposed Platt Field housing site are two abandoned, underground (motor vehicle) gasoline storage tanks near Cushman Avenue opposite Building 1282. These tanks appear to date from the World War II period of Fort Hase. No other potentially hazardous or toxic waste (HTW) generating facilities have been found within the proposed housing site. Federal regulations [40 CFR 280.71(b) and (c)] require the Station to close the tanks by filling or removal. The Naval Facilities Engineering Command Pacific Division (PACDIV), acting on behalf of the Station, conducted a site investigation of the tanks in July 1990. Preliminary laboratory results indicate there is no ground water contamination but some petroleum hydrocarbon contamination is present near to one of the tanks in 1 of 3 soil borings taken. Because the lateral extension of contamination does not appear to be extensive, only minimal * remediation appears to be needed at time of closure. Prior to closure, further study will determine the extent of soil contamination, make a risk assessment, and recommend a method of tank closure. Closure will probably involve some soil removal, * replacement of clear soil, and removal of the tanks from the ground. To avoid possible adverse impact, the proposed housing site has already been configured to avoid the tanks by 90-100 feet. The houses could also be extended 20 feet further away. Closure will occur as soon as feasible, subject to availability of funds. It may come before or after occupancy.

A Finding of No Significant Impact is recommended.

1.

PURPOSE AND NEED FOR ACTION

1.1 Purpose. This proposed project will provide family housing quarters at Marine Corps Air Station, Kaneohe Bay (MCASKB), Hawaii (Figures 1 and 2). The purpose of this housing project is to provide affordable housing to military personnel and their families, reduce commute time between the home and duty station, increase response time in an emergency, and raise the morale of personnel who must reside in lower standard housing off station. The project is not associated with any changes in the numbers of military personnel to be assigned to MCASKB.

1.2 Need

a. *Oahu-wide Housing Demand*

(1) Housing for all services is planned and managed by the Oahu Consolidated Family Housing Office (OCFHO), under the U.S. Army Support Command, Hawaii. OCFHO estimates that there is a current, 1989 deficit of 1,686 acceptable family housing quarters for military personnel throughout Oahu [USASCH OCFHO, 1989a].

(2) The current Oahu-wide military family housing deficit is projected to increase to 6,056 acceptable family housing quarters by 1994, of which over 96 percent would be among enlisted personnel. There will be an estimated deficit of 4,268 adequate quarters for E4-E9 accompanied personnel and an estimated deficit of 1,582 quarters for E1-E3 accompanied personnel [USASCH OCFHO, 1989a]. Officers (including warrant officers) would experience an island wide deficit of 206 acceptable units.

b. *Current Demand in MCAS Kaneohe Bay Region*

(1) According to 1989 calculations (USASCH OCFHO, 1989b), there is a total demand for 4,282 family housing units in the Kaneohe Bay/Kailua area of Oahu (i.e., 4,282 military personnel with families, including 45 personnel who are involuntarily separated from their families due to lack of adequate housing). To supply that need, there are 1,889 housing units under military control (including 1,861 active units). Six of those housing units are considered inadequate.

(2) About 46.7 percent (or 2,000) of the military families in the Kaneohe Bay housing area either choose or are forced (for lack of on-station housing) to live in rented or purchased private housing assets. Of that number, 415 families are housed in unacceptable commercial units. The current deficit of 438 adequate family housing units in the Kaneohe Bay region is derived by subtracting the current vacant or inactive military housing units from the total number of families which are unacceptably housed. OCFHO defines the "unacceptably housed" as those personnel who are involuntary separated and those housed in

substandard military and commercial units. Following the official military family housing justification form, the official deficit of 393 housing units is derived by subtracting 45 units of vacant rental private housing from the total deficit of adequate housing units.

(3) Eighty percent of the current deficit is found among enlisted personnel (E1-E9). The E4-E9 group comprises over 58 percent of the total deficit, or 255 dwelling units. In the MCASKB housing region, officers and warrant officers experienced a deficit of 42 units (10.7 percent).

c. *Projected Housing Demand in MCAS Kaneohe Bay Region.* By 1994, family housing shortages for MCASKB personnel will increase to a total of 1,883 units, of which the biggest deficit will be in the E4-E9 accompanied enlisted personnel grouping, amounting to 1,127 units or nearly 60 percent of the total. The junior enlisted E1-E3 accompanied personnel will experience a deficit of 639 units (33.9 percent) and the officers will experience a deficit of 117 units (6.2 percent). A small part of the junior enlisted deficit may be satisfied by the 40 new Army Family Housing units planned for construction in FY90 near the North Beach area of MCASKB.

d. *Effects of Living Off-Station*

(1) The 2,370 military families who reside off-station live within communities around Kaneohe Bay, near Kailua, or in Waimanalo (*Figure 1*). These communities range between two to fifteen road miles distance from MCASKB, but the level of civilian commuter traffic is high, sometimes requiring about 60 minutes commute time to MCASKB from the distant communities.

(2) The cost of privately rented or leased housing in the Kaneohe Bay/Kailua region averages \$1,098 per month for a two bedroom unit and \$1,408 to \$1,750 per month for a three to four bedroom unit, respectively (USASCH OCFHO, 1990). For E7-E9 personnel, for instance, in addition to basic pay and a basic allowance for subsistence, the monthly basic allowance for quarters (BAQ), the variable housing allowance (VHA), and the maximum housing cost allowance (MHCA) in 1990 totalled between \$1,088 and \$1,158 per month (USASCH OCFHO, 1989c). Affordability is officially defined as unacceptable when out-of-pocket expenses for rent exceed 15 percent above BAQ/VHA. Thus, it can be seen that adequate housing for these personnel and their families (usually at least two children) is not affordable in Hawaii. In addition to cost factors, the rental vacancy rate of privately-owned or non-military public housing is the lowest in the Nation at about 1.2 percent, compared with the national average of about 5 percent (USASCH OCFHO, 1989b).

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Proposed Action

a. Two alternative sites were considered for housing at MCAS Kaneohe Bay: Site A at Platt Field and Site B at Fort Hase Beach. These two sites were selected from a larger universe of 12 possible housing sites at the Station, which were recently analyzed (MCASKB, 1989). The two alternative sites had the least likely environmental and siting constraints (e.g., slope, proximity to wetlands, endangered species, or significant historic/archaeological sites, Coastal Zone Management permit requirements) for the number of housing units envisioned.

b. Of the two alternative sites at MCASKB, the Platt Field site is being recommended for the proposed housing because of its lesser environmental constraints and the lower cost of developing adequate utility support. A conceptual layout of the proposed project is shown in *Figure 3*. *Figure 4* depicts a conceptual profile of housing at Platt Field. There will be no requirement that the contractor's layout or profile be the same as this conceptual layout, but to maximize the number of units to at least 276, it is likely to resemble *Figure 3*. Two smaller, alternative housing layouts at Platt Field (*Figures 5 and 6*) were first developed before the Station agreed to expand the proposed housing development into the Third Regiment's Platt Field parade ground. Scheme #1 would provide 184 dwelling units and Scheme #2 would provide 120 units. [The Proposed Action, *Figure 3*, was originally designated Scheme #3.]

c. Under the proposed action, all units will be provided with kitchen appliances, but no washer/dryer. The latter will be provided by the installation. Each dwelling unit (DU) will have a single-unit carport. Supporting facilities will consist of all utilities and communications (telephone and cable TV), roadways and walkways, landscaping, tot lots, and street lighting.

d. Structural features and surfaces will be comprised of materials, paints, or other surface coverings which are resistant to the salt-water corrosive quality of the atmosphere.

e. Approximately half the storm water would flow toward Drainage Ditch "F" (also known as *Mokapu Canal*), parallel to Lawrence Road. The other half would flow toward a swale along Mokapu Boulevard (Blvd), which flows westward into Mokapu Canal. Under a project reprogrammed for early FY 1991, the existing drainage discharge characteristics of Mokapu Canal will be improved. The Station plans to dredge a 1.25 mile long stretch of the drainage ditch and stabilize or grade its banks. This separate project will improve the hydraulic capacity and efficiency of the ditch to collect, store, and convey storm water runoff into Kane'ohe Bay through Nu'upia Ponds, including runoff

from the proposed housing project (Muroda and Associates, Inc, 1990).

2.2 No Action. The No Action alternative would involve a continuation of existing housing subsidies to enlisted personnel so that they could rent quarters off station. Since housing is so expensive in Hawaii, there are few affordable quarters for military personnel on Oahu (see Paragraph 1.2c). The lack of affordable and adequate housing and its distance from the duty station would continue to affect re-enlistment rates or retention of experienced personnel and could affect enlistment of new recruits. The response time to an emergency could continue to be slowed due the distance through heavy traffic that some personnel must now travel to report to their duty stations. Overall, the No Action alternative does not meet the objective of the project to provide affordable and convenient housing on station.

2.3 Fort Hase Beach Site

a. An Alternative Site for family housing is located along Middaugh Street at the coast and on lower Daly Road (**Figure 2**) (U.S. Marine Corps, "MCAS, Kaneohe Bay, Hawaii Master Plan," October 1983). Two alternative schemes were developed for the Fort Hase Beach: Scheme #1 for 160 housing units (**Figure 7**) and Scheme #2 for 122 units (**Figure 8**).

b. Housing at Fort Hase Beach has several site disadvantages:

(1) First, the site is subject to wave damage or inundation from a tsunami or a 100-year (one percent or less chance of occurring in any given year) storm-generated coastal wave/flood. The at-risk units would need to be constructed so as to raise their base floor elevations above the expected flood levels. This would be accomplished by placing vehicular parking and other non-habitable uses on the ground floor (see conceptual profile, **Figure 9**). This site constraint would result in a higher construction cost for the affected housing units.

(2) Second, the site's flat, low topography and proximity to the beach, which could subject it to wind-blown sands.

(3) Third, the clearing of the site for housing would take beach strand habitat now used by the golden plover (Pluvialis dominica) and other migratory shore birds for feeding. The golden plovers are protected under the [Federal] Migratory Bird Treaty Act.

(4) Fourth, the presence of new residential and street lights will probably aggravate present adverse impacts to young fledgling wedgetailed shearwater (Puffinus pacificus) sea birds, which often become disoriented in their first flights by city night-time lights in their efforts to leave cliff-side nesting

areas around Ulupa'u Crater (U.S. MCASKB, 1989). The disorientation has resulted in the birds "falling out" or crashing into residents' houses and back yards. Injured birds then become easy prey to cat and dogs or may be hit by passing cars (Dr. D. Drigot, 1990).

(5) Fifth, any housing construction related excavations in the lower half of the alternative housing site would adversely affect [State of Hawaii Archaeological] Site 2886 or "Coastal Site" (PACDIV, 1983). Site 2886 was included as a portion of Bishop Museum Site 50-OA-G5-67, which, as Feature C, has been included in the Nu'upia Ponds, a prehistoric fishpond complex that was determined eligible for listing in the National Register of Historic Places on August 8, 1984. A housing project there would have a high chance for disturbance to significant subsurface historic and prehistoric burials and other cultural features.

(6) Sixth, the larger of the two schemes at Fort Hase Beach would displace an existing softball field and existing basketball courts.

(7) Seventh, the cost of providing wastewater service would be less than schemes at Platt Field, but considerably more to provide electrical service than the Platt Field schemes. Other adverse and beneficial impacts would be similar to the proposed action.

c. The Fort Hase Beach Alternative site's cost and environmental site disadvantages appear to outweigh its advantages.

2.4 Bellows Air Force Station Site. An alternative housing site outside of Marine Corps Air Station, Kaneohe Bay is at nearby Bellows Air Force Station Site (BAFS), located in the northwestern corner of the installation (**Figure 10**). This area is occasionally used by the U.S. Marine Corps for week-day maneuvers. Any construction activities on this site would very likely result in the destruction of significant subsurface archaeological materials associated with the Bellows Field Archaeological District. The Archaeological District is listed in the National Register of Historic Places, and includes the earliest known prehistoric cultural site in Hawaii. There are no sufficiently sized potable water distribution or wastewater collection systems nearby. Providing new utility lines to connection points for water supply and sewage collection and treatment would be a significant cost factor and would depend on City & County of Honolulu approval. Finally, the site has not been approved for housing by the U.S. Air Force, 15th Air Base Wing. The environmental and cost characteristics of BAFS appear to be more disadvantageous compared to the other alternative site.

2.5 Comparison of Alternative Sites. Table 1 summarizes and compares the environmental effects of the seven alternatives at three sites.

TABLE 1. COMPARISON OF ALTERNATIVES

ENVIRONMENTAL RESOURCE	NO ACTION	PROPOSED ACTION	PLATT FIELD		FORT HASE BCH		BELLOW'S AFS SITE
			1	2	1	2	
			- ST	- ST	- ST	- ST	- ST
Air Quality							
Geology/Hydrology							
Endangered Species							
Protected Wildlife Areas							
Archaeological/Historic Sites							
Affordable Housing	-	+	+	+	+	+	+
Schools		-	-	-	-	-	-
Economic Impact		+	+	+	+	+	+
Recreational Facilities	+	- M	- M	- M	- M	- M	- M
Visual Resources							
Traffic Flow							
Safety							
Coastal Flooding							
Interior Flooding							
Aircraft Noise							
Haz Mat/USTs		- M					
Utilities							
Water Supply							
Wastewater Facs		- M					
Electricity							
Land Use Consistency		+	+	+	+	+	+
Legend:	+	Beneficial Impacts	- ST	Short-term Adverse Impacts			
	-	Long-Term Adverse Impacts					
Blank		No/Negligible Impacts	M	Mitigation Provided			

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

a. This Environmental Assessment combines the "Affected Environment" and "Environmental Consequences" sections of normally formatted EAs and Federal environmental impact statements (EISs), as allowed by the Council on Environmental Quality's (CEQ) NEPA regulations (40 CFR 1502.10). A third section is added which includes measures to avoid or mitigate significant adverse impacts, if applicable, thus making them insignificant or negligible. The first four sections of Chapter 3 are introductory in nature or provide general background.

b. The purpose of an Environmental Assessment is "to determine the extent of environmental impacts of a project and decide whether or not those impacts are significant." An Environmental Impact Statement (EIS) must be prepared for "major Federal actions significantly affecting the quality of the human environment" (40 CFR 1502.3). Therefore, the determination of *significance* is of key importance in recommending whether an agency's evaluation of environmental impacts may appropriately end with a finding of no significant impact (FNSI) as the NEPA decision document or must proceed to preparation of a full EIS.

c. The *significance* of an impact requires consideration of both context and intensity. First, "the significance of an action must be analyzed in several contexts [added emphasis] such as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action" [40 CFR 1508.27(a)].

d. *Intensity* refers to the severity of impact and the following should be considered in evaluating intensity [40 CFR 1508.27(b)]:

- * Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial;
- * The degree to which the proposed action affects public health or safety;
- * Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
- * The degree to which the effects on the human environment are likely to be highly controversial;
- * The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks;
- * The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;
- * Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts;
- * The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places;

or may cause loss or destruction of other significant scientific, cultural, or historical resources;

- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973;
- Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

3.2 Regional Setting.

a. MCASKB is located on the Mokapu Peninsula on the northeastern shore of Oahu, Hawaii, about 13 miles northeast of Pearl Harbor and north of the Honolulu area (**Figure 1**). The Station encompasses 2,951 acres and is bordered to the south by Nu'upia Ponds, to the east by Kailua Bay, to the north by the Pacific Ocean, and to the west and southwest by Kaneohe Bay (**Figure 2**) (VTN Pacific, 1983). MCASKB is on the windward side of Oahu, separated from Pearl Harbor and Honolulu by the narrow, but rugged Ko'olau Mountain range.

b. The two major communities of windward Oahu are Kaneohe and Kailua, located to the west and east, respectively, of the Station (**Figure 1**). In the 1960s and 1970s, these communities experienced rapid growth. While growth continues, it has declined relative to Oahu as a whole. Most of the developed area is residential, with some supporting commercial service activities. Many of the region's residents commute to jobs in the Honolulu/Pearl Harbor region.

3.3 Station History and Mission

a. The first military presence on Mokapu Peninsula was the Kuwa'aohe Military Reservation on the west side of Ulupa'u Head/Crater, established in 1918. It was enlarged and recommissioned Camp Ulupa'u in 1941 and as Fort Hase [pronounced "ha-zay"] in February 1942. Fort Hase was U.S. Army Headquarters for the harbor defense of Kaneohe Bay. As seen in a 1945 map (**Figure 11**), the Fort Hase cantonment area extended east to west along Maclachlan and Middaugh Streets. The cantonment area was a tent city (Fiddler, 1956), that extended about 150 feet across Cushman Avenue into present-day Platt Field and the proposed housing site. In 1947, Fort Hase became a skeleton outpost of Fort Ruger, near Waikiki, and became part of the Navy's Marine Corps Air Station, Kaneohe Bay in 1952, when it was bought from Harold Castle.

b. In August 1939, the Navy began construction of a seaplane base at the western end of Mokapu Peninsula that became known as Naval Air Station, Kaneohe Bay on 15 February 1941. At the end of the War, the facility consisted of seaplane runways, five hangars, a 5,700-foot airstrip and other support facilities. activated from 1949, the Station was reactivated in 1952 as a Marine Corps Air Station. It currently has a 7,767-foot runway on which three squadrons of 12 each Fighter/Attack (F/A)-18 jet

aircraft are continually training. Light, medium, and heavy helicopter squadrons are also active.

c. The primary mission of MCASKB's host command is to maintain and operate facilities that are needed to provide services and material support for air and ground units of the First Marine Expeditionary Brigade, whose support units include the Third Marine Regiment, the Marine Aircraft Group 24, and the Brigade Service Support Group-1. Tenant commands include the 1st Radio Battalion (Bn) FMF; B Company, 77th Communications Bn; the Naval Oceans Systems Center Hawaii Laboratory, and the Naval Regional Medical Clinic and Dental Center. The total population stationed or living at MCASKB, including dependents, totalled 16,685 in 1989. Over 1,800 civilians are employed at MCASKB.

3.4 Site Description

a. The proposed housing site is at Platt Field, is bordered by Mokapu Road, Cushman Avenue, and Lawrence Road and Drainage Ditch "F" (*Figures 2 and 3*). Platt Field is used as a parade ground by the 3rd Marine Regimental Headquarters, located in Building 1088 near the corner of Mokapu Road and Cushman Avenue (*Photo 1*). At the corner of Mokapu Road and Cushman Avenue, adjacent to Building 1088, is the new Combined Arms Staff Trainer (CAST), Bldg. #6036, in the process of being completed (*Photo 1*). Platt Field parade ground merges into Joe E. Brown and Coleman Fields, which have designated sports facilities comprised of four softball diamonds, one football/soccer field, and an obstacle course is located along Cushman Avenue (*Photos 2 and 3*). *Photo 2* includes a newly constructed (1989) Youth Center and associated picnic tables, which are functionally integrated with the use of the ball fields. The state-owned Mokapu Elementary School is located southwest at the corner of Mokapu Road and Drainage Ditch "F" (Mokapu Canal).

b. Across Cushman Avenue to the east are several motorized equipment parks and maintenance shops, the 3rd Marine, 1st Radio Battalion Motor Pool (Bldg. 454). The proposed housing area will extend across and close off the portion of Cushman Avenue between MacLachlan Street and Lawrence Road. That area is unused at present; it is separated from the single family quarters along McLennan Drive by a row of sparsely planted bushes (*Photo 4*). Toward Lawrence Road are two new small metal warehouses, now used for storage.

3.5 Climate and Air Quality

a. *Existing Conditions.* Mokapu Peninsula is on the north-east, windward side of Oahu island. It is subject to an average 13 mph, salty, moisture-laden trade wind that passes northeast to southwest 75 percent of the year (M&E Pacific, 1985). The annual median rainfall is about 50 inches per year. A 10-year storm would be the equivalent of 8 inches of rainfall in a 24-hour period (M&E Pacific, 1985). It is not unusual for MCASKB to

undergo a two-inch downpour in a one-hour period. Daily average temperature ranges between 71 and 80 degrees (F), and relative humidity ranges between 69 and 80 percent. With no industrial activities in the area, air quality is virtually pristine, although corrosion from the salt-laden air is a continual maintenance constraint.

b. *Environmental Consequences.* Neither the proposed project or any of its alternatives would have any long-term effect on climate or air quality. There would be insignificant and unavoidable short-term emissions of hydrocarbons, carbon monoxide, and the generation of particulate matter, such as dust, by the construction equipment. The predominant trade winds should prevent the concentration of any objectionable fumes or smells at the construction site or in surrounding areas. The Request for Proposal specifications will contain provisions to require the Contractor to comply with all Federal and State air quality regulations and standards. This includes the requirement that the Contractor "control the generation of dust and flying particles from his operations to prevent creation of a nuisance to Government personnel [including nearby housing area residents] and operations in the surrounding area. Dust barriers will be required to protect adjacent family housing".

c. *Measures to Avoid or Mitigate Adverse Impacts.* None are needed.

3.6 Geology, Soils, and Hydrology/Drainage.

a. *Existing Conditions.*

(1) **GEOLGY.** Mokapu was formed by basaltic lava eruptions from four separate volcanic vents, five to two million years ago. Following this volcanic period, the area known today as Mokapu Peninsula was inundated by successive high stands of the sea during which an extensive coral reef was formed (Luecker, et Al, 1984). The proposed housing site is underlain by Consolidated Calcareous Marine Deposits, perhaps 100 feet thick, which are composed of lithified and recrystallized coral reef limestones and lithified calcareous sands (Luecker, et Al, 1984). The materials are bordered to the west (approximately under Mokapu School) by Unconsolidated Noncalcareous Deposits, which consist of younger alluvial materials derived from weathered basaltic rock. The deposits are congruent with a former embayment, clearly visible on 1940's aerial photographs, which was filled in during the 1950s-1960s. Hydraulic conductivity is estimated to be between 10^{-5} and 10^{-4} cm/sec.

(2) **SOILS.**

(a) The MCASKB Master Plan indicates the northern half of the 24-acre housing site to consist of Kea'au Clay (VTN Pacific, Inc., 1983 and Luecker, et Al, 1984). Kea'au Clay (KC) is a very dark, greyish-brown soil, developed in aluminum on

limestones. Runoff is slow, with a low permeability of 0.06-0.20 inches per hour (in/hr). The southern one-half consists of Mamala Stone Silty Clay Loam, which is a dark, reddish-brown soil likewise with slow and medium runoff and a permeability of 0.63 to 2.0 in/hr.

(b) A soils investigation was undertaken for this project (USACE POD, 1990c). Borings indicated that the northwestern portion of the site and other isolated pockets are underlain by 3-5 feet of fill, consisting of silty clays (CH) and clayey silts (MH), with zones of coral sands. These materials have a moderate swell potential.

(3) HYDROLOGY/DRAINAGE (FLOODPLAIN ANALYSIS).

(a) The Soils Investigation found groundwater in 5 of 13 borings, ranging from 6.4 to 10.8 feet below ground surface. There are no active potable water wells on the Station; all water is supplied from outside sources via the City & County of Honolulu Board of Water Supply.

(b) Low lying parts of MCASKB are subject to the risk of wave or inundation damage from earthquake-generated tsunamis and storm-generated high waves. Much of the Fort Hase Beach alternative housing site is within a 100-year flood zone as designated by the U.S. Department of Housing and Urban Development (HUD) Flood Insurance Rate Map (FIRM). A 100 year flood is one that has no more than 1 percent chance of occurring in any one year.

(c) The Platt Field site is designated by the FIRM as Zone "D", an area of possible but undetermined flood hazard. The proposed housing site itself is flat and has no drainage structures, but it grades slightly to the west toward Drainage Ditch "F" (also known as Mokapu Canal). Mokapu Canal is one of the station's principal drainage ways, running generally north-northeast to south-southwest parallel to Lawrence Road, and following the former natural embayment pattern, where it empties directly into Kane'ohe Bay, skirting around the Nu'upia Ponds Wildlife Management Area (Figure 2). The drainage ditch skirts around Halekou Pond in the Nu'upia Ponds Complex, but is connected to Heleloa Pond via a natural opening in the pond's wall (Muroda & Associates, 1990). These ponds are part of the Nu'upia Ponds Complex. There is also a channel connecting Halekou Pond to the drainage ditch which provides for tidal exchange between the pond and Kaneohe Bay. The Station has a proposed FY91 Dredging Improvement Project designed to improve Mokapu Canal. Under this project, existing openings between the ditch and Halekou Pond will be retained to provide circulation and inflow of terrestrial nutrients into the pond ecosystem. An Environmental Assessment is under preparation for this project (Muroda & Associates, Inc., 1990).

(d) A drainage report, including hydrologic and floodplain analyses, was conducted for this project to determine the flood hazard of the site to the proposed housing project, and the flooding impact of the proposed project on surrounding lands (USACE POD, 1990a). Using the Rational Method, peak discharge in Mokapu Canal at the northern side of Mokapu Boulevard was calculated to be 490 cubic feet per second (CFS) for the 10 year storm (no more than 10 percent change of occurring in any given year) and 840 CFS for the 100 year storm. The 412-acre, 100-year drainage area includes Klipper Golf Course and various housing areas. **Figure 12** shows the existing 100-year flood outline (the dark black line). Under 100-year flood conditions, about 1.38 acres is now a potential hazard area. Under 10-year flood conditions, about 0.86 acres of the 24 acre proposed housing site is now a potential hazard area.

b. *Environmental Consequences.*

(1) **SOILS.** Neither the underlying geological structure or soils present any difficulties to construction or long-term occupancy as a housing site. Soil erosion will not be a factor. The swell potential of the on-site soils will be further investigated by the Developer. The ground surface will have to be cleared and grubbed to a minimum depth of 6 inches. The grubbed surface will need to be moisture conditioned to reduce swell potential and compacted prior to placement of any additional fill (USACE POD, 1990c).

(2) **GROUND WATER.** No drinking water aquifers will be affected by the project.

(3) **FLOODING.**

(a) The floodplain impact analysis assumes that the Station's proposed FY91 Dredging Improvement Project designed to improve Mokapu Canal will be constructed. Under those future conditions, with-project peak discharge in Mokapu Canal at the northern side of Mokapu Boulevard was calculated to be 520 CFS [+30 CFS] for the 10 year storm and 910 CFS [+70 CFS] for the 100 year storm. Therefore, the 100-year flood outline depicted on dotted lines on **Figure 12** reflects the impact of both the drainage improvement and the proposed housing projects.

(b) Even with the proposed canal clearing project, the improved drainage canal will be unable to contain runoff from a 10-year or 100-year flood in certain areas. Thus, under the 100-year flood condition, about 0.46 acres of the housing site at its north portion will still flood unless further avoidance measures are implemented. The Army drainage analysis concludes, however, that the housing project itself will not further

aggravate the current flooding conditions experienced or that could be experienced (USACE POD, 1990a).

(4) E.O. 11988 FLOOD PLAIN EVALUATION. In compliance with Executive Order 11988, Flood Plain Management, it has been determined that is no practicable alternative than to place the proposed housing at Platt Field, MCASKB. Over half of the other alternative site at Fort Hase Beach in MCASKB is already encumbered by a 100-year coastal floodplain zone. Only 2 percent of the recommended site is so encumbered. The off-station site at Bellows Air Force Station is not known to be in a flood-prone area, but would have significant, adverse impact on an important prehistoric area listed on the National Register of Historic Places. As noted below, design measures will be implemented to avoid flood damage to the inhabitants and contents of the proposed residences.

c. *Measures to Avoid or Mitigate Adverse Impacts.*

(1) The project already requires a complete drainage system to be installed which will accommodate storm water runoff from the site. The proposed storm drain collection system of artificial channels and natural swales and channels will be designed for a ten (10) year, one-hour storm intensity. Off site drainage is to be designed for a fifty (50) year, 1-hour storm (see Paragraph 2.1f).

(2) In addition, the developer will be required to insure that there will be no 100-year flood impacts to the 0.46 acres of housing area that could be potentially be impacted. Structural avoidance measures include filling the area to an elevation above flood elevations, raising the foundations of the affected residences or providing other flood-proofing design measures. A non-structural solution would be to site residences outside the impact 1/2 acre area, and instead utilize the area for other non-inhabited uses.

(3) The flood plain analyses assumed the FY91 improvements to Mokapu Canal are implemented. If that project cannot be accomplished prior to occupancy of the housing project, almost one (1) more acre of potential residential area would have to be flood proofed.

3.7 Biological Resources.

a. *Existing Conditions.*

(1) PLATT FIELD. The entire proposed housing site is a mowed grassed recreational area. There are 17 kiawe (Prosopis pallida) trees in two clusters on the open parcel of land west of Cushman Avenue and 4 kiawe trees near the new Youth (Community) center. Most of the 24-acre proposed site is covered with mowed bermuda grass. In 1983, there were about 950 acres of mowed grass habitat at the Station. This habitat provides a major

resting ground for an estimated population (1983) of 1200 wintering plovers, primarily the American golden plover (Pluvialis dominica) (U.S. Fish and Wildlife Service, 1983). The golden plovers are protected under the [Federal] Migratory Bird Treaty Act. Cattle egrets (Bulbulcus ibis) have also been observed there, due to the presence of irrigation systems built into the recreational fields and the storm drain, which is often filled with standing water.

(2) OFF-SITE CONDITIONS. No Federally-listed endangered or candidate species (plants, birds or animals) are known to be found in areas immediately outside of Platt Field (VTN, 1983), but the endangered Hawaiian Stilt is occasionally observed feeding in the Mokapu Canal (Drigot, 1990). There are no protected wildlife areas adjacent to the proposed housing site, but the Nu'upia Ponds Wildlife Management Area is located 2500-3000 feet "downstream" from the housing site (**Figure 2**). The Wildlife Management Area includes habitat for three federally listed endangered birds, The endangered bird species are the Hawaiian stilt (Himantopus mexicanus knudseni), the Hawaii coot (Fulica americana alai), the Hawaiian duck (Anas wyvilliana), and the Hawaiian gallinule (Gallinula chloropus sandvicensis) (Muroda & Associates, Inc, 1989). As previously noted, the infusion of freshwater into the Wildlife Management Area's Halekou and Heleloa ponds via breaks from drainage ditch is not considered injurious and, in fact, may be beneficial since these endangered Hawaiian waterbirds prefer freshwater (Park Engineering, 1989).

b. *Environmental Consequences.*

(1) Platt Field. The proposed project will not affect any Federally or State listed endangered or threatened species of plants or animals. The project will unavoidably require the removal all turf grass, but will be partially replaced by landscaping, including grass and bushes. Ten kiawe trees east of Cushman Avenue and four kiawe trees on the western side near the Youth Center may be affected. The kiawe trees will be retained * if possible. Construction activities, such as noise, will temporarily displace but are not expected to result in permanent or significant adverse effects to any feeding or nesting areas of the golden plovers, or other birds or animals. *

(2) *Off-Site Impacts.*

(a) The Station's Nu'upia Ponds Wildlife Management Area is not expected to be affected any more than current conditions. An "Evaluation of Predicted Stormwater Runoff Changes on Endangered Waterbird Habitat, Nu'upia Ponds Wildlife Management Area" (Park Engineering, 1989) concluded that proposed changes of 9 acres of undeveloped land use to developed land use would not threaten the food supply or nesting substrate habitat of endangered waterbirds within the Nu'upia Ponds Wildlife Management Area. The conclusion of no significant impact was based on (1) only minor land use changes (a 1.5 percent increase

of developed acreage) projected for the future; (2) relatively low levels of pollutant concentrations estimated for the stormwater runoff; and (3), relatively small differences in pollutant concentrations for the various land uses.

(b) The proposed project will not change land use as defined in the Stormwater Runoff study; therefore, neither will the study's conclusion regarding impact change. Because the definition of Developed Land in the study includes both recreation (parks, playgrounds, and athletic fields) and housing (single and multi-family), there will not be any change of Developed Land use in transforming 24 acres of recreation-use land into 24 acres of housing-use land.

c. Measures to Avoid or Mitigate Adverse Impacts. Removal of any trees during construction will require special permission from the Government. Species and varieties of new bushes and trees for landscaping will be especially selected to be easily maintained; locally hardy; avoid poisonous elements; avoid exuding sap; avoid dropping leaves, fronds, flowers, berries, seeds, or nuts (e.g., coconuts); or avoid those which have branches extending over parking areas which could be used as a roost by birds. Although Station Order MCOP11000.8B requires relandscaping with native species if possible, the above limitations will exclude some native species.

3.8 Historic Sites

a. Existing Conditions

(1) Based on an intensive search and analysis of applicable historical and archaeological documents, including the "Historic Property Inventory: Marine Corps Air Station, Kaneohe Bay" (Tuggle and Hommon, 1986), and several projects performed by U.S. Navy archaeologists, it was reasonable to hypothesize that subsurface agricultural and/or pond fields remains from the prehistoric and early historic period are likely present at Platt Field (Figure 13). Early maps and aerial photographs reveal the presence of the upper end of an embayment extending northward from the present Nu'upia Pond area through the area now occupied by Mokapu Elementary School.

(2) There is only one recognizable surface remain from the early 1940s when the Army's Fort Hase main cantonment extended into Platt Field from the east along MacLachlan and Middaugh Streets. This consists of a possible flagpole foundation near the corner of MacLachlan Street and Cushman Avenue. Based on an analysis of aerial photographs of the Fort Hase cantonment area, there is no evidence to suggest that the feature has any significance. There appear to have been many such possible flag pole features at one time, perhaps for unit colors. A ground-level 2 X 5 foot concrete rectangle block, about 200 feet opposite the intersection of Cushman and Middaugh, was first thought to be a possible animal burial site, but has

been confirmed to be parade reviewing platform, according to Station personnel.

* (3) The field work for a pre-construction archaeological survey of the site was completed in August 1990, under contract to Archaeological Associates Oceania (1990). Thirty-two backhoe trenches were excavated down to the coralline, tuff, or basalt substrate. The trenches varied in length from 10-25 feet and about 2 feet wide. The trenches were aligned along four transects, covering nearly the entire proposed housing site (see Plate 3 of Enclosure to October 10, 1990 letter, **Appendix A**).

(4) No cultural deposits were exposed in any of the trenches below the upmost recent historic period fill layers [see Section 3.6a(2) above]. Therefore, the hypothesis that native Hawaiian historic properties, such as fishery and dry land agricultural structures are present at the housing site, is not supported. *

b. *Environmental Consequences.*

(1) The proposed housing project, including excavations for required utilities, will not affect any existing subsurface prehistoric or historic cultural resources likely be eligible for listing to the National Register of Historic Places. No further archaeological investigations are needed there.

(2) The Government archaeological reports and findings of effect must be coordinated with the State Historic Preservation Officer (HPO) as required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations (36 CFR Part 800 and Army Regulation 420-40). A preliminary determination of no effect was sent to the Hawaii Historic Preservation Officer (HPO) by letter of October 10, 1990 in compliance with Section 106 of the National Historic Preservation Act (NHPA). That letter is included in Appendix A. It is anticipated that the HPO will concur with the Government's preliminary determination of no effect. The draft and final archaeological survey Report's will be coordinated with the HPO later to obtain a formal concurrence of no effect.

(3) The separate project of replacing existing sewer lines with larger diameter pipes could require the old utility trenches to be excavated wider than originally excavated, and thus could uncover and impact previously undisturbed subsurface cultural materials. The measures noted below will mitigate for any significant adverse impacts to archaeological resources.

c. *Measures to Avoid or Mitigate Adverse Impacts.*

(1) The construction specifications in the Sec 802 Project Request for Proposals will contain a standardized requirement designed to protect any historic materials uncovered during construction and to assure that efforts to deal with them

are coordinated with the State Historic Preservation Officer. No other measures are necessary for the housing project.

(2) Once excavation plans are made available to the Government for the separate project of replacing existing sewer lines, a determination of effect will be coordinated with the SHPO. If needed, archaeological monitoring of trenching excavations will be performed.

3.9 Socio-Economic Factors

a. *Existing Conditions*

(1) As reported in May 1989, MCASKB had a total resident population of 16,885 (USMC FMFP, 1989). As of October 1989, there were 1,880 military personnel and 5,360 [accompanying] dependent family members residing on Station (USASCH DRM, 1989). Unaccompanied personnel account for the remaining large proportion of the Station's resident population. Another 1,819 civilians worked on Station, and about 3,000 retirees had access to its community facilities.

(2) There is a wide range of community services and facilities on Station to accommodate the non-operational needs of the military personnel and their families. These are adequately sized or staffed to serve the existing population. Public education is provided by the State government for children from kindergarten through 12th grade (high school). There is one, K-6 elementary school on station, Mokapu Elementary School. Mokapu currently has a enrollment of 930 pupils in grades 1-6, and 90 pupils in kindergarten (Estomago, 1989). An estimated (Estomago, 1989) several hundred elementary school-aged students are bused by the State to nearby four elementary schools in Kailua and Kaneohe, and have been for the last seven years. According to Estomago, incoming new military parents are not informed in advance which school their children will attend, although there is an attempt to put siblings in one school. All intermediate school (Grades 7 to 9) and high school (Grades 10 to 12) are bused to nearby schools in Kailua or Kaneohe.

b. *Socioeconomic/Environmental Consequences*

(1) The physical change in the environment is the construction of new housing that is designed and sized for senior NCO personnel (grades E7 to E9) to company grade officers (W1-W4 and O1-O3). The direct social consequences of the addition of these housing units will be a maximum estimated increase of over 960 Station residents, which is based on all 276 dwelling units being occupied by an average 3.5 occupants (the Department of Defense design criteria). The proposed FY90 Army Family Housing project of 40 units combined with the proposed Section 802 project could cumulatively result in a Station resident population increase of over 1,100.

(2) Based on the DEPARTMENT OF DEFENSE design criteria, the projected increase of resident Station population should include over 400 dependent children. The principal indirect effect of this increase will impact the State school system, and to a certain degree the Station's recreational and child-care facilities. The State of Hawaii Department of Education (DOE) presumes an average 1.3 children per military family (USACE HED, 1988), which for the proposed project would mean almost 360 children.

(3) These new school-aged children are not expected to be new to the State-operated school system, but at most would transfer to the specific elementary, intermediate and high schools serving the present MCASKB population. This is because the proposed project is not associated with a proposed rise in the Station's assigned military personnel; it mainly provides affordable housing to those personnel already in Hawaii. Depending on their present place residence, some children may not need to change their present schools. Nevertheless, there will be an increase in the numbers of children who must be bused, at state government expense, to civilian schools in the nearby communities of Kailua or Kaneohe. These circumstances have been coordinated by letter to the State of Hawaii DOE (USACE HED letter, 7 June 1990). The DOE's response (July 2, 1990) estimated increases in enrollment will include 70-75 students at Mokapu Elementary School, 10-15 students at Kailua Intermediate School, and 15-20 students at Kalaheo High School, a total of up to 110 students.

(4) The difference between the total 360-400 estimated increase in children at the project and the maximum 110 children estimated to be attending local schools can be explained mainly by the large number of children who are expected to be under the age of 5. Research conducted for the Army Family Housing project at Helemano Military Reservation in central Oahu suggests that for E1-E4 personnel, about 60 percent of the dependent children will be under five years of age (USACE HED, 1988). This means that it is as important to plan for more or larger child-care facilities, as it is to plan for more classrooms.

(5) According to the DOE, a new building at Mokapu Elementary School on MCASKB is already planned to be ready for occupancy in September 1992 (Hawaii DOE, 1990). The DOE further indicates that there will be eight class rooms installed, which should be sufficient to accommodate most of the current shortage (Noe, 1990). It is expected that the proposed Section 802 project will still result in new students being bused off Station until State Legislative funds can be obtained to accommodate the planned additional increase. DOE has indicated that Kailua Intermediate and Kalaheo High Schools should have adequate classroom facilities to accommodate the projected growth of school-aged children (Hawaii DOE, 1990).

(6) Using economic impact forecast models developed by the U.S. Army Construction Engineering Research Laboratory (CERL) and University of Illinois at Urbana, it is projected that the proposed 276 unit housing construction project will generate in City & County of Honolulu direct economic benefits worth over \$7.9 million in sales volume and induced benefits worth over \$10.75 million in sales volume (Appendix C). Approximately 93 direct jobs will be generated and another 337 jobs will be induced or supported. The model also projects that 177 private sector rental units and 99 owner-occupied residences would be freed up for occupancy in the City and County of Honolulu by civilian parties. The loss of military personnel as renters will have short-term effects on landlords, no long-term effect because there is an acute shortage of rental units in Hawaii.

c. *Measures to Avoid or Mitigate Adverse Impacts.* None are needed. The economic impact of Federally supported students on local public schools is offset by an existing Federal program that annually subsidizes the State Department of Education on a per pupil basis.

3.10 Recreation and Visual Resources

a. *Existing Conditions.*

(1) The entire housing site currently consists of mowed grass available for recreation or physical training uses. There are about 930 acres of mowed grass open space at the Station, including Klipper Golf Course. The Joe E. Brown and Coleman Fields designate sports facilities comprising four softball diamonds and one football/soccer field (Photos 2 and 3). At the northern corner of the housing site is an old building which serves as a Little League announcer's booth. Adjacent to the Joe E. Brown Field is a newly constructed (1989) Youth Center and associated picnic tables. All these facilities are centrally located between the old (1940s era) 2500-Area Family Housing quarters and the Capehart [Family] Housing area west of Lawrence Road.

(2) An obstacle course is located along Cushman Avenue. It is used as part of physical training exercises by Marine Corps personnel. Platt Field is used as a parade ground.

(3) Nearby recreational facilities include Klipper Golf Course, immediately north of the corner of Cushman Avenue and Lawrence Road. There is another softball field in the vicinity of Fort Hase Beach. There are baseball diamonds located in the midst of the Marine barracks areas south of Mokapu Road, but these facilities are not normally available to dependent children. Other ball diamonds are off Mokapu Road, two in the vicinity of "C" Street and 3rd and one at the vicinity of 3rd Street and Low.

b. *Environmental Consequences.*

(1) The proposed project would displace four softball diamonds and equipment and a soccer/football field with goal poles. Displacement of these recreational resources elsewhere on Station will be an adverse effect considered to be significant by some members of the station population. If replacement facilities are provided concurrent to their displacement, significant adverse effects should be able to be avoided or at most mitigated.

(2) About 2.8 percent of the existing inventory of open space would be removed by the project. That percentage may be misleadingly low, however, because other open space areas are not so centrally located, and they are not used as intensively as the sports facilities in northern Platt Field.

(3) The proposed housing project will not affect any of the "Sites of Spectacular Views." identified in Figure G-8 of the 1983 Master Plan. It will, however, fill a currently open green space with the clutter of many buildings, albeit with landscaping.

c. *Measures to Avoid or Mitigate Adverse Impacts.* The Master Plan suggests placing additional playing field in the open space at the H-3 gate. This location, however, is too far removed from the housing area. Fort Hase or lower Daly Road locations are closer to most housing quarters. The affected sports facilities will be relocated, likely to the general vicinity of Fort Hase Beach.

3.11 Transportation Factors

a. *Existing Conditions*

(1) The proposed housing site is accessible by motor vehicles only from Cushman Avenue, which is a collector road accessible from the arterials, Lawrence Road and Mokapu Road. The connection between Mokapu Boulevard (Blvd) and Lawrence Road via Cushman Avenue has been in existence for 50 years. Lawrence Road connects directly to the Main Gate, which is located at the terminus of the cross-island H-3 Freeway (portions still under construction). Mokapu Road connects to the Mokapu Gate which exits toward Kailua.

(2) It is likely that much of the current privately-owned vehicular (POV) traffic load on Cushman Avenue is related to use of the various ball fields there now there. Other users of Cushman Avenue include POV traffic from existing family housing areas heading toward Klipper Golf Course or the Officer's Club, and POV traffic from the unaccompanied personnel barracks south of Mokapu Blvd heading toward North Beach.

b. *Environmental Consequences.*

(1) In the short term, traffic flow on Craig Avenue and its intersection with Mokapu Boulevard, may be slowed by the replacing of sewer pipelines along Third Street and crossing Mokapu Boulevard and Selden Street. Traffic delays on the other roads around the project area are not expected. Full occupancy of the proposed housing project is not expected to result in any long term traffic impacts.

* (2) If construction materials consist of large-sized prefabricated housing parts, their ground transportation from Honolulu Harbor to MCASKB may cause short-term traffic delays, particular through the Wilson Tunnel on Likelike Highway, which is the most likely route.

c. *Mitigation Measures.* If the condition in Paragraph 3.11b(2) prevails, the Contractor should consider moving any unusually large trailer loads through Wilson tunnel at times which avoid the high traffic volume commute periods. *

3.12 Safety and Health Factors

a. *Existing Conditions*

(1) **INTRODUCTION.** The primary mission of Marine Corps Air Station, Kaneohe Bay, brings with it health and safety land-use constraints related to jet aircraft and helicopter noise, flight safety patterns, and explosives safety quantity distance (ESQD) zones for the munitions storage facilities. The ocean side location of the Station subjects it to the risk of wave or inundation damage from earthquake-generated tsunamis and storm-generated high waves.

(2) **AIRCRAFT NOISE.** **Figure 14** displays computer-generated, day/night average (Ldn) sound levels (noise contours) in decibels (dBa) based on aircraft usage at MCASKB airfield in 1987-1988 (VTN, 1983). The noise generators included simulations of the newly assigned F/A-18 jet-fighter aircraft. The proposed project site lies about 500 meters outside (in a place having Ldn sound levels below) the 65 dBa contour and almost entirely outside the 60 dBa contour. Accident potential zones associated with use of the runway or current flight tracks are located at their closest point (over the Pacific Ocean) over 1500 meters north of the proposed housing site. Residential use of such a parcel is clearly compatible with the aircraft mission of the Station.

(3) **EXPLOSIVES.** There are no explosive use or storage activities near by nor are there electromagnetic radiation (EMR) constraints located at or near the proposed housing project site.

(4) **FLOODING.** The safety risk of flooding is addressed in Section 3.6, Geology, Soils, Hydrology, and Drainage.

(5) HAZARDOUS OR TOXIC MATERIALS.

(a) The 1984 "Navy Assessment and Control of Installation Pollutants Initial Assessment Study of Marine Corps Air Station Kaneohe Bay, Hawaii (Luecker, et Al, 1984) found no evidence of any surface or likely subsurface hazardous or toxic waste within or nearby the proposed housing site. The 1984 Study was updated in 1990 by a field search of the project site and a thorough search for old maps and photographs of the site. This investigation revealed no evidence of potentially hazardous or toxic waste (HTW) generating facilities, except as noted below. An oil soaked piece of plywood covering a hole near the abandoned gas tanks described below proved only to be a communications box full of debris (Cooke, 1990).

(b) The "Map of U.S.M.C. Air Station, Kaneohe Bay, Oahu, Territory of Hawaii, Showing Conditions on 1 March 1956" displays a Motor Gasoline Filling Station, Facility S-1530 on the eastern side of Platt Field, approximately opposite the present Building 1282 (Figure 3). The Station's 1989 "Underground Storage Tank (UST) Inventory" identified two tanks, Nos. 63 and 64, at that location. Sheet 3 of 1964 plans to construct Combat Equipment Maintenance Shops, Area No. 1, depicts the tops of the tanks as about 18 inches below surface, and provides instructions that the tanks were to be filled with water and capped. Photo 5 and paced-off measurement of the concrete caps indicates the tanks may be about 1.5 ft X 10 ft and 3 ft X 10 ft in surface profile.

(c) On the basis of the above studies [see EA Paragraphs 3.12a(5)-(5)], and in accordance with the Environmental Baseline Survey protocol found in Army Regulation 200-1, Appendix B (23 April 1990), it has been determined that the housing site itself appears to be a Type I property, except for its southeastern corner, which should be classified as a Type II property. A Type I Property is one at which there is little potential for environmental contamination or disruption from past, present, or proposed activities. A Type II Property is one with some potential for environmental contamination or disruption due to past, present or proposed activities. A Type II property requires that an investigation, including intrusive sampling, be conducted to determine the presence or absence of a contamination problem.

(d) The Naval Facilities Engineering Command Pacific Division, acting on behalf of the Station, conducted a * Site Investigation of the two tanks in July 1990. Three soil borings were taken around the tanks. Preliminary laboratory analysis results indicate the presence of a minimal (38 parts per million) of total petroleum hydrocarbons in one of the three borings in the surrounding soil, near one of the tanks (O'Carroll, 1990 and Analytical Technologies, Inc, 1990). The borings also found no groundwater present. *

b. Environmental Consequences

(1) SHORT-TERM CONSTRUCTION IMPACTS. Construction of the proposed project will result in some unavoidable short term generation of noise, vibration, and probably some dust. Although some of these activities will occur in close proximity to family housing quarters, they are not likely to create unhealthy conditions for the residents. Noisy construction, such as the initial clearing or ditch excavating, may be disruptive to classroom activities at Mokapu Elementary School, which is only 200 feet west of the site at its nearest point. The Request for Proposal specifications will contain provisions that will require the Contractor to comply with applicable Federal, State, and City and County regulations governing air emissions, noise, water quality control, traffic movement, and general safety. The specifications also will have provisions requiring fencing of the construction site, an important safety factor for a site which is so close to the school play yard.

(2) AIRCRAFT NOISE AND EXPLOSIVES SAFETY. According to guidance provided in the "MCASKB Hawaii AICUZ [Air Installation Compatible Use Zone] Update" (August 1983), the location of family housing outside (or below) the 65 dBa noise contour is an acceptable land use with no required design constraints. There are likewise no explosive safety quantity distance (ESQD) zone constraints placed on or likely hazards to the proposed project.

* (3) HAZARDOUS OR TOXIC MATERIALS. As a result of the avoidance and mitigation measures outlined below, the presence of hydrocarbons in the soil near one of the underground tanks are expected to have no adverse safety or health impacts on the housing construction workers or on the future residents of the proposed housing project. *

c. Measures to Avoid or Mitigate Adverse Impacts.

(1) The construction specification contain adequate measures to avoid short term adverse safety and health effects (involving air emissions, noise, water quality control, traffic movement, and general safety) associated with construction.

(2) In compliance with Federal regulations regarding underground storage tanks (40 Code of Federal Regulations, Part 280.71(b and c), the Station is obliged to close the two underground tanks. "Closure" means that the tanks would be either be removed or filled with an inert solid material. Either form of closure could also require removal of any contaminated soil. Because the preliminary results of the Navy's laboratory analysis of soil samples from borings adjacent to the underground tanks does not show extensive lateral extension, only minimal remediation appears to be needed at time of closure. Prior to closure, further study will determine the extent of soil contamination, make a risk assessment, and recommend a method of

tank closure. Closure will probably involve some soil removal, replacement of clear soil, and removal of the tanks from the ground. *

(3) Since the timing and budgeting of these follow-up actions are not certain at this time, the Station and the U.S. Army Oahu Consolidated Family Housing Office have decided to redraw the boundaries of the housing project to avoid the underground tanks. This will make, as approximately depicted in **Figure 3**, the closest current project boundary about 90-100 feet from the nearest underground tank. If necessary, the actual housing and other inhabited areas can be moved an additional 20 feet further away.

3.13 Utilities

a. *Existing Conditions.*

(1) **WATER.** Water for domestic uses and for fire protection is supplied to the proposed project area via a station water distribution system from existing reservoirs and an auxiliary water main, which is intermittently accessed depending on the pressure in the main station distribution system. The Station water supply derives from a metered connection to the City & County Board of Water Supply system.

(2) **SEWAGE.**

(a) Collection lines from a gravity flow sanitary sewer system are present at the peripheries of the housing site. Wastewater is treated on Station at the MCASKB Sewage Treatment Plant (STP), after which most is discharged via a nearby City & County (C&C) of Honolulu force main, that runs from the C&C operated Kailua Wastewater Treatment Plant (WWTP) into the ocean via the Mokapu Outfall. About 500,000 gallons of treated effluent is used daily for on-station irrigation, in accordance with State of Hawaii permits.

(b) A U.S. Army Corps of Engineers study, including sewer flow monitoring under contract to ADS Service, Inc., was performed to determine the adequacy of the existing sewer lines between the proposed project and the WWTP (USACE POD, 1990b). The proposed maximum infiltration/inflow (I/I) is 3.5 mgd wet weather peak flow/2.44 mgd dry weather peak flow. Projected peak flow, at four monitoring stations, presumes the maximum Station population is present.

(c) The sewer flow monitoring analysis found that even without the proposed project, two downstream (between the project site and the WWTP) lines (or reaches) of the sewer collection system would surcharge (overflow) under wet weather peak flow conditions, assuming the barracks, which discharge into those lines, were completely full. Because some of these lines are already partly insilted (despite ongoing routine

maintenance), additional lines might also surcharge in the peak flows occurred when those lines were heavily silted.

b. *Environmental Consequences*

(1) **WATER.** Based on a design population of three persons per two-bedroom unit there will be a design population of 828 persons, each using an average 150 gallons of potable water per day (USACE POD, 1990b). The average daily water usage is thus calculated at 124,200 gallons per day (gpd) or 86.3 gallons per minute (gpm). Fire flow requirements are 750 gpm for 90 minutes. Therefore, the total water system capacity will be the greater of 2.5 X average daily demand (216 gpm) or the Peak Fire Flow Demand + 50 percent of average daily consumption (794 gpm). The latter demand requires a minimum pressure of 20 psi (pounds per square inch). Field tests of the local fire hydrants indicated a residual pressure of 79 psi, well above the 20 psi minimum required. Therefore, the proposed project will have no adverse effects on the Station water system, nor on its neighbors' use of water for domestic or emergency use.

(2) **SEWAGE.**

(a) Using NAVFAC standards for flow calculations (3.0 persons per housing unit and 120 gallons per consumer per day (gpcd), the proposed project population is expected to generate an average daily flow of 99,360 gallons of wastewater per day (gpd) (USACE POD, 1990b). Peak flow is estimated at 397,400 gallons per day (276 gpm). Based on adverse existing grades and the shallow depth of the nearest appropriate sewer manhole (SMH), a six-inch force main, pump station and wet well will be needed to discharge from the 276 unit housing project to the SMH.

(b) The MCASKB sewage treatment plant has sufficient treatment capacity to accommodate the proposed project and its maximum peak flows. The sewer flow analysis indicates that three sewer lines have the wet-weather peak-flow potential to surcharge due to the contribution of the proposed housing project, in addition to those two lines already having the potential to surcharge.

(c) Surcharged sewer lines would result in raw sewage overflowing the sewage manholes and perhaps backing out of individual toilet fixtures. Occurring during peak wet weather conditions, the raw sewage could mix with surface standing or

moving flood waters. This would widen the spatial impact of this severe health hazard.

c. *Measures to Avoid or Mitigate Adverse Impacts.*

(1) No avoidance or mitigation measures relative to potable water supply are needed.

(2) The three sewer lines with surcharge potential that are affected by the proposed project will be upgraded.

(3) The two other sewer lines with existing surcharge potential may also be upgraded as a mitigation measure of the proposed project.

(4) Another sewage line, which would receive flows from both Mokapu School and the proposed housing project, was calculated to be 1.8 percent under capacity. Because it was so close to capacity and because it is likely that both generators would not be pumping a peak discharge at the same time, a recommendation for replacement or improvement was not warranted.

3.14 Land Use Plans and Policies

a. *Existing Conditions.*

(1) Existing land use conditions are described in Paragraph 3.4 and the remaining sections of Chapter 3 above. Land use on MCASKB is not subject to state or local policies of review and approval, except where they directly affect the coastal zone, as required by Subsection 307(c)(1) of the National Coastal Zone Management (CZM) Act and the Hawaii CZM Program or where they may affect non-Federal lands. Land use on MCASKB is guided by the "MCAS Kaneohe Bay, Hawaii Master Plan (October 1983).

(2) According to the Master Plan, a new "super" block complex for consolidated community services is planned for area immediately to the east of Platt Field, as bounded by Mokapu Road, Harris Street, McClachlan Road and Cushman Avenue. The complex will contain a station exchange, exchange service outlets, commissary, family service center, child care center, church, and library. The existing gas station will remain. The commissary is the first facility proposed for construction which is planned for FY 92.

b. *Environmental Consequences.*

(1) The Master Plan, prepared in 1983, does not identify any need for additional family housing at the Station. It does identify the proposed site of the FY90 AFH project and the alternative Fort Hase Beach sites as possible housing sites but notes that they might be costly to develop due to slope and tsunami constraints. The Plan also recommends higher density

housing in general, but without any demolition of existing housing (Ma, 1990).

(2) The proposed project is not expected to have any direct impact on the coastal zone. It is the decision of OCFHO and MCASKB that a Federal Consistency Determination will not be prepared, but in accordance with National CZM Act regulations (15 CFR 930.35), a copy of this Environmental Assessment will be provided to the Hawaii State Office of Planning, which manages the Hawaii CZM Program, for their review.

(3) The placement of the planned consolidated community services complex will not adversely impact the proposed family housing. In turn, the proposed housing project at Platt field will be enhanced by its proximity to the proposed community service development.

c. *Measures to Avoid or Mitigate Adverse Impacts.* None are needed.

3.15 Energy Requirements and Conservation Potentials of Various Alternatives and Mitigation Measures.

* None of the proposed housing facilities will be equipped with energy intensive air conditioning units. None of the various other recommended mitigation measures are conducive to the use of energy conservation measures.

3.16 Any Irreversible and Irrecoverable Commitments of Resources Associated with the Proposed Action.

In addition to construction materials (presumably concrete, metals, and wood), tree habitat for birds and other animals may be lost, if unavoidable, and grassy habitat for the golden plover bird will be lost. Open space will also diminish. No cultural resources are likely to be affected.

3.17 Relationship between Local, Short-term Use of the Human Environment, and the Maintenance and Enhancement of Long-term Productivity.

Platt Field has not been used for agriculture production since the late 1930's. Since 1940, it has been used for troop housing and for open space/recreation. It will not likely return to its original use in the long-term future.

3.18 Urban Quality, Historic and Cultural Resources, and Design of the Urban Environment, including Reuse and Conservation Potential of Various Alternatives.

The proposed action will not likely affect any historic or cultural resources. The objective of the project is to house 276 families that will be in a multi-unit structure type setting. Siting the housing project at the Fort Hase Beach site or at

Bellows Air Force Station would result in a new land use that would be out of character with existing and surrounding land use and at the expense of likely destruction of significant cultural materials, whereas use of the proposed site should have fewer such adverse impacts.

3.19 Any Probable Adverse Environmental Effects which Cannot be Avoided Should the Proposal be Implemented.

The displacement of recreational facilities at Platt Field will be unavoidable, but mitigated by their replacement elsewhere.

4.

CONCLUSION

This Environmental Assessment concludes that the proposed action to construct 276 two-bedroom family housing units to commence in Fiscal Years 1992 and 1993 at Marine Corps Air Station, Kaneohe Bay, Hawaii does not constitute a major Federal action having a singly or cumulative significant effect on the quality of the human environment. Therefore, it is recommended that a Finding of No Significant Impact be prepared.

5. LIST OF REFERENCES, PERSONS, AND AGENCIES CONSULTED

5.1 List of References

Analytical Technologies, Inc.

- 1990 "Preliminary Lab Analysis Results of August 1990 to Environmental Science and Engineering (ESE) for Underground Tanks Nos. 65 and 66." In ESE, Results of Subsurface Investigations (Draft Report). Prepared for U.S. PACNAVFACENGCOM, Pearl Harbor Naval Reservation, Hawaii, September 1990.

Drigot, Diane [Ph.D., (Environmental Protection Specialist)]

- 1989 "Environmental Constraints/Requirements Related to Proposal for Increasing the Number of Housing Units at MCAS Kaneohe Bay." 5 December 1989.

Hawaii Marine

- 1989 "Have You Seen This Bird?" , Photo Caption, 23 November 1989.

Luecker, Elizabeth B., John E. Edkins, Jacqueline R. Francis, Nicholas Morgan, & Richard J. Watts (Naval Energy and Environmental Support Activity, Port Hueneme, CA) and Linda Lay (Ordnance Environmental Support Office, Indian Head, MD).

- 1984 "Navy Assessment and Control of Installation Pollutants. Initial Assessment Study of Marine Corps Air Station Kaneohe Bay, Hawaii." UIC: N00318, April 1984.

M&E Pacific, Inc. (Honolulu, Hawaii)

- 1985 "Environmental Assessment: Erosion Protection for Shoreline, Kaneohe Klipper Golf Course, Marine Corps Air Station, Kaneohe Bay, Oahu, Hawaii." Contract No. N62742-84-D-0093. Prepared for Marine Corps Air Station, Kaneohe Bay, Hawaii 96863-5001, November 1985.

Muroda and Associates, Inc.

- 1990 "Environmental Assessment for Grading, Dredging, and Drainage Control, Marine Corps Air Station, Kaneohe Bay, Hawaii." January, 1990.

ParkEn, Inc [dba Park Engineering]

- 1989 "Evaluation of Predicted Stormwater Runoff Changes on Endangered Waterbird Habitat, Nu'upia Ponds Wildlife Management Area, Marine Corps Air Station, Kaneohe Bay, O'ahu, Hawai'i." Prepared for Naval Facilities Engineering Command, Pacific Division. July 1989.

Tuggle, H. David, Ph.D.; edited by Robert J. Hommon Ph.D.

(U.S. Naval Facilities Engineering Command, Pacific Division).

- 1986 "Historic Property Inventory, Marine Corps Air Station, Kaneohe Bay, Management and Recommendations."

U.S. Army Corps of Engineers (USACE), Honolulu Engineer District
(HED)
1988 "Final Environmental Impact Statement for Army Family
Housing New Construction Project, Helemano Military
Reservation, City & County of Honolulu, Island of Oahu,
Hawaii." October 1988.

USACE HED
1989a "Draft Request for Proposal, Technical Requirements."
November 1989.

USACE, Office of the Chief of Engineers (OCE)
1989 "Architectural and Engineering Instructions (AEI) Design
Criteria." 13 March 1987; 2 June 1989 Revisions.

USACE, Pacific Ocean Division [POD] (Engineering Directorate,
Design Division)
1990a "Drainage Report for 802 Proposed Housing Project at
Kaneohe Marine Corps Air Station." September 1990.

USACE POD (Engrg Dir, Des Div)
1990b "Final Sewage and Water Study, Platt Field. Section 802
(Rental Guarantee) Program for Family Housing, Marine
Corps Air Station, Kaneohe, Oahu, HI." September 1990.

USACE POD (Engrg Dir, Foundations, Materials & Survey Division)
1990c "Preliminary Soils Investigation Report. Section 802
(Rental Guarantee) Military Family Housing, Kaneohe
Marine Corps Air Station, Oahu, Hawaii." July 1990.

U.S Army Support Command, Hawaii (USASCH), Directorate of Resource
Management (DRM)
1989 "Population Data - Army/Army Supported." Report Control
Symbol APZV-FD-1. 31 October 1989.

USASCH Oahu Consolidated Family Housing Office (OCFHO)
1989a "Military Family Housing Justification. Consolidated-
OCFHO." DD Form 1523, 31 January 1989.

USASCH OCFHO
1989b "Fiscal Year 1989 Oahu Family Housing Survey." Prepared
by Bay K.C. Yee for U.S. Army Corps of Engineers, Pacific
Ocean Division, July 1989.

USASCH OCFHO
1989c "Number of Vacant Units (Rentals), Bedroom Size."
June 30, 1990.

USASCH OCFHO
1990 "Housing Allowances by Pay Grade - Oahu." Effective
01 Jan 90.

- U.S. Marine Corps Fleet Marine Force Pacific (USMC FMFP)
 1989 FMFP letter 11011 15B, (First Endorsement on CMC ltr 1011 LFL 31 Aug 1987), SUBJECT: "Facility Support Requirements Planning Document for MCAS Kaneohe Bay," 28 Apr 1989.
- U.S. Marine Corps Air Station, Kaneohe Bay.
 Var. "Annual Reports Required by Special Permits from U.S. Fish and Wildlife Service and State of Hawaii Department of Land and Natural Resources Regarding Handling of Injured/Disoriented Wildlife. Various Years
- U.S. Fish and Wildlife Service
 1983 "Fish and Wildlife Management Plan for the Marine Corps Air Station, Kaneohe Bay, Oahu, Hawaii."
- U.S. Naval Facilities Engineering Command, Pacific Division (PACDIV)
 1983 "Historic Property Inventory, Marine Corps Air Station, Kaneohe Bay: History, Survey and Site Descriptions."
- VTN Pacific, Inc. (Honolulu, Hawaii)
 1983 "Master Plan for Marine Corps Air Station Kaneohe Bay, Oahu, Hawaii." Prepared for U.S. Navy, Naval Facilities Engineering Command, Pacific Division (PACNAVFACENGCOM), Pearl Harbor, Hawaii, October 1983.

5.2 List of Persons or Agencies

- Drigot, Diane [(Ph.D.,) MCASKB Environmental Specialist]
 1989 Personal Communication, August 1989, and September and October 1990.
- Estomago, Donna (Vice Principal, Mokapu Elementary School)
 1989 Personal Communication, August 1989.
- Kanno, Alton (MCASKB Environmental Protection Specialist)
 1990 Personal Communication, June 1990.
- Ma, Henry (General Engineer, MCASKB)
 1990 Personal Communication, 29 June 1990.
- Noe, Walter (State Department of Education, Windward District)
 1990 Personal Communication, 6 June 1990.
- O'Carroll, Theresa (Environmental Science & Engineering, Contractor to U.S. PACNAVFACENGCOM regarding Underground Storage Tanks)
 1990 Personal Communication to Dr. Diane Drigot, October 1990.
- Yonehara, Wayne. (PACNAVFACENGCOM)
 1990 Personal Communication, 1990.

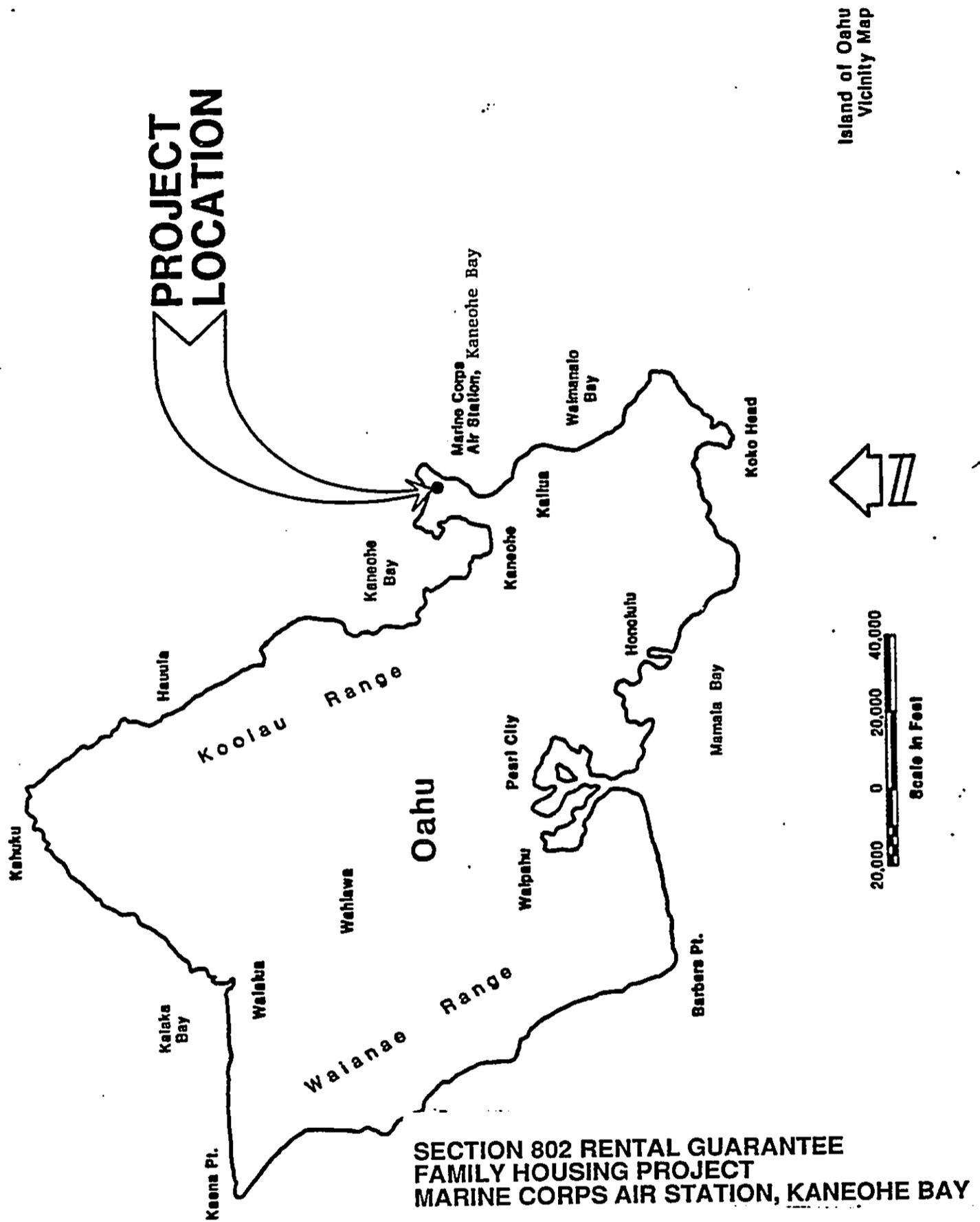


FIGURE 1

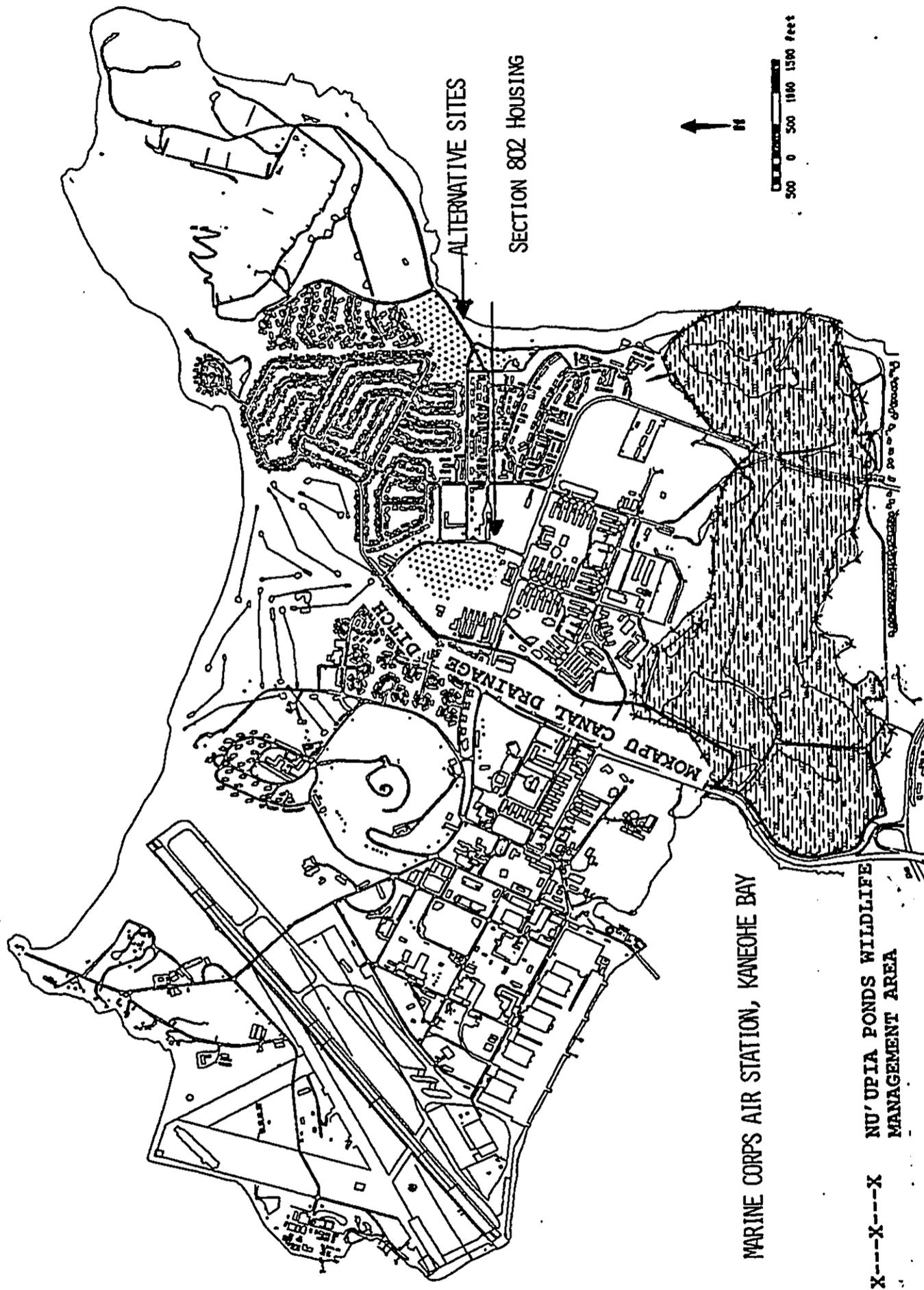
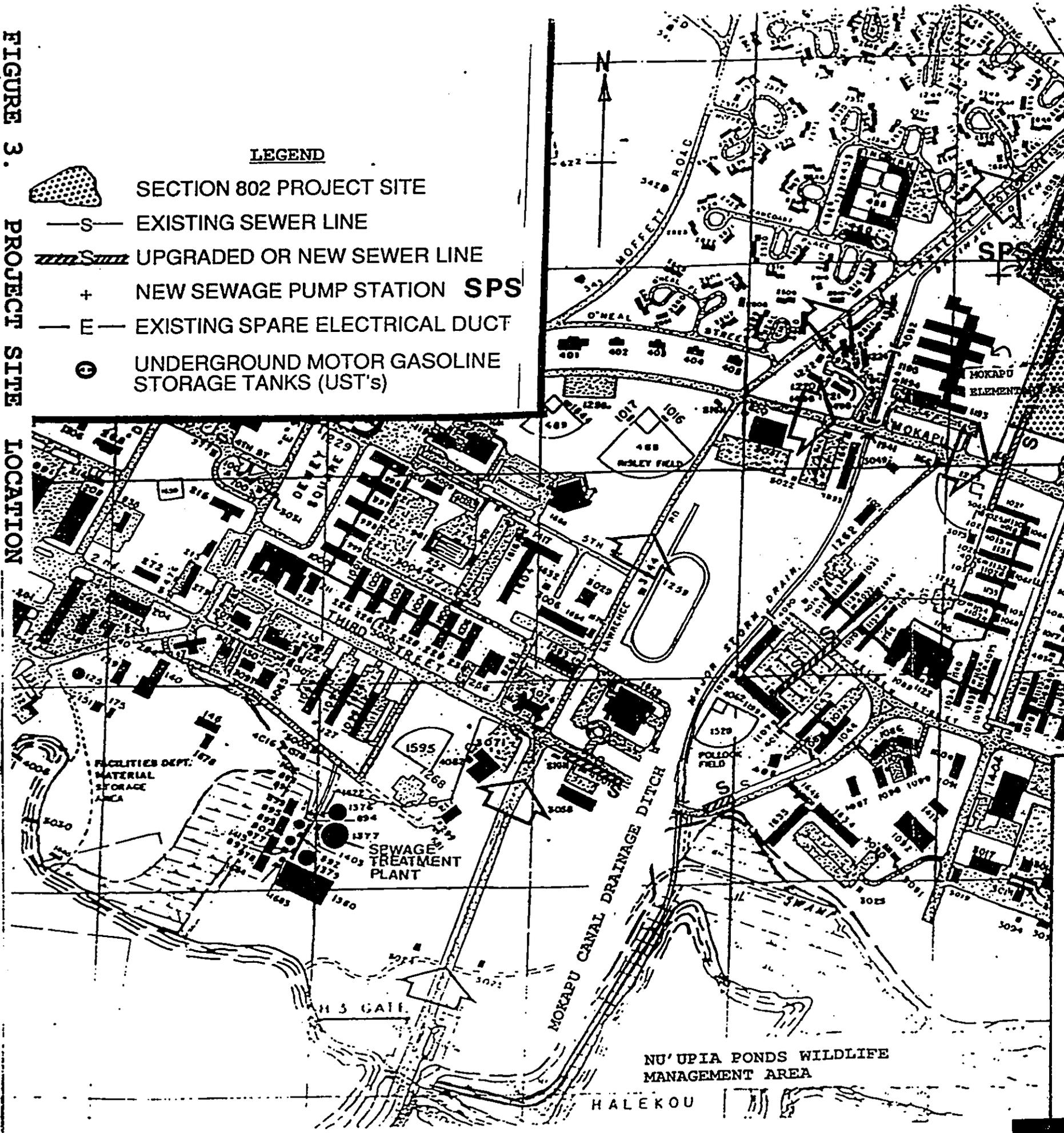
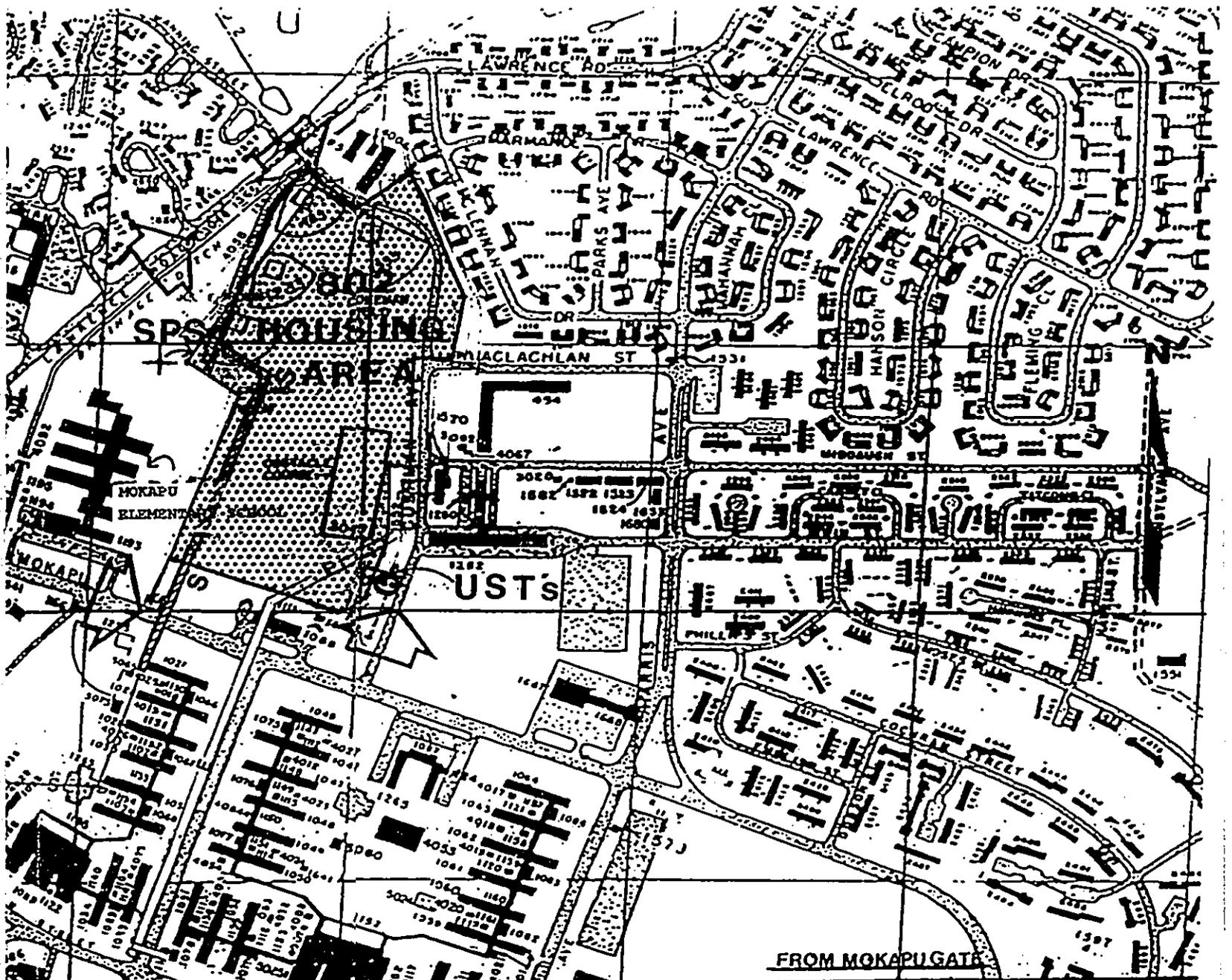


FIGURE 2

FIGURE 2

FIGURE 3. PROJECT SITE LOCATION



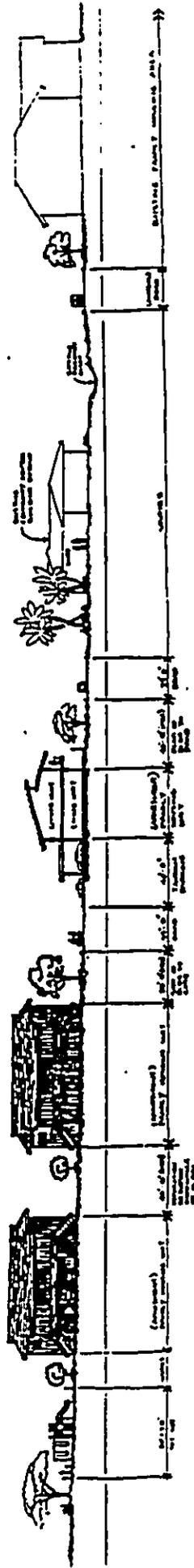


MAP OF
 U. S. MARINE CORPS AIR STATION
KANEOHE BAY, OAHU HAWAII
 SHOWING CONDITIONS ON
1 SEP 87



**SECTION 802 RENTAL GUARANTEE
 FAMILY HOUSING PROJECT
 MARINE CORPS AIR STATION, KANEOHE BAY**

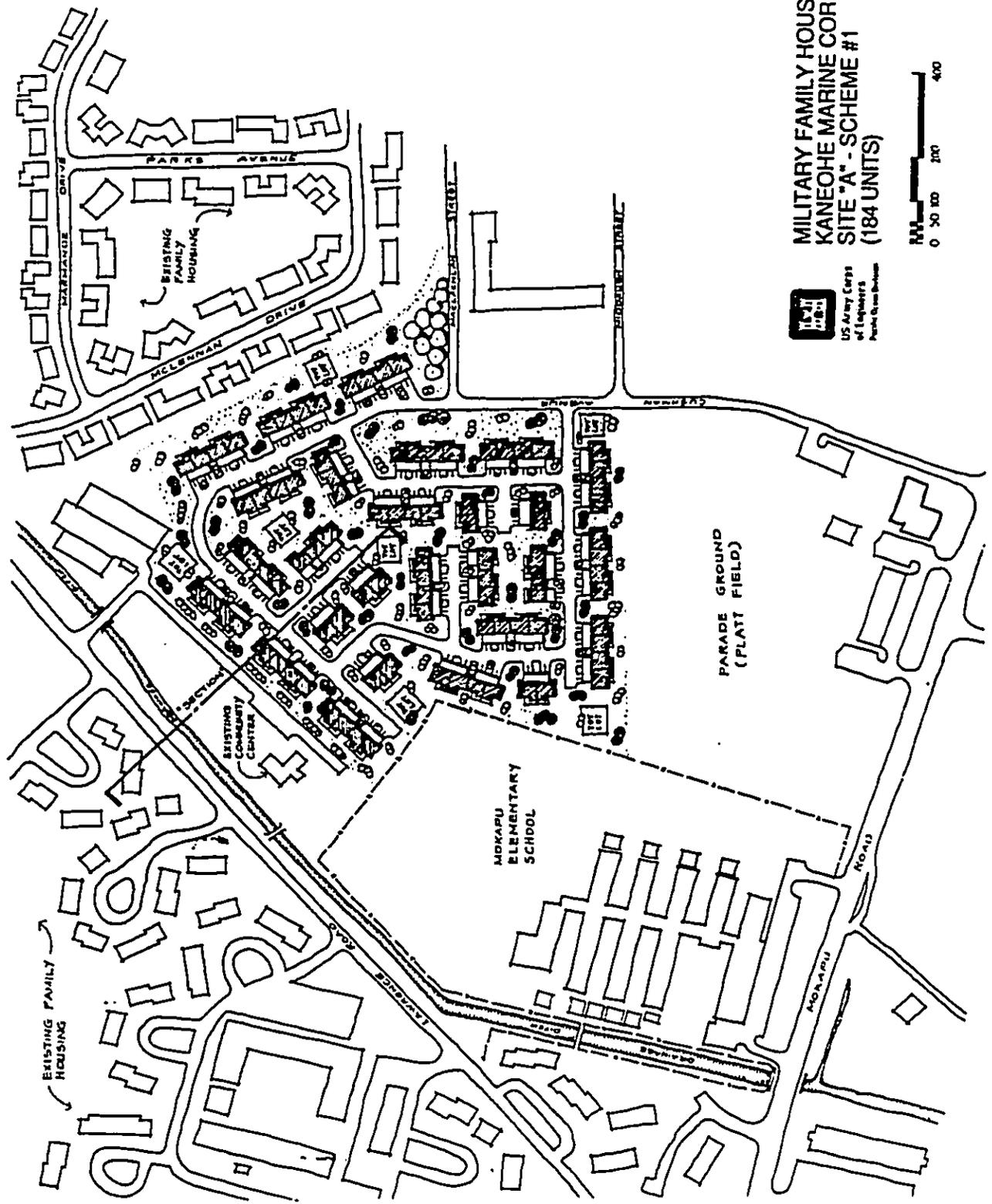
FIGURE 4



MILITARY FAMILY HOUSING
KANEHOHE MARINE CORPS AIR STATION
ELEVATION/SECTION - SITE "A" SHT 3 OF 6



FIGURE 4



MILITARY FAMILY HOUSING
 KANEOHE MARINE CORPS AIR STATION
 SITE "A" - SCHEME #1
 (184 UNITS)

SHT 1 OF 6

FIGURE 5

FIGURE 5

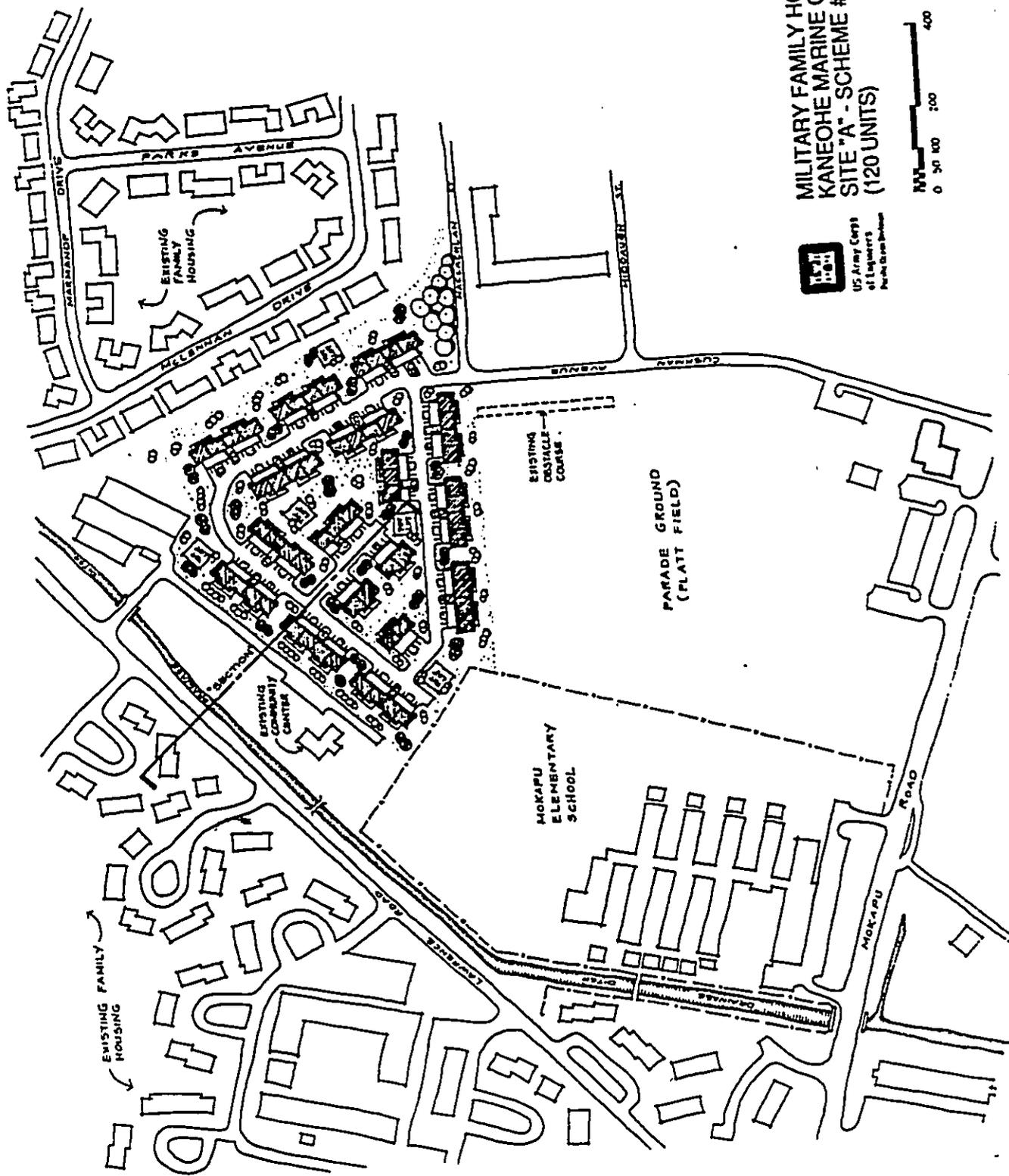
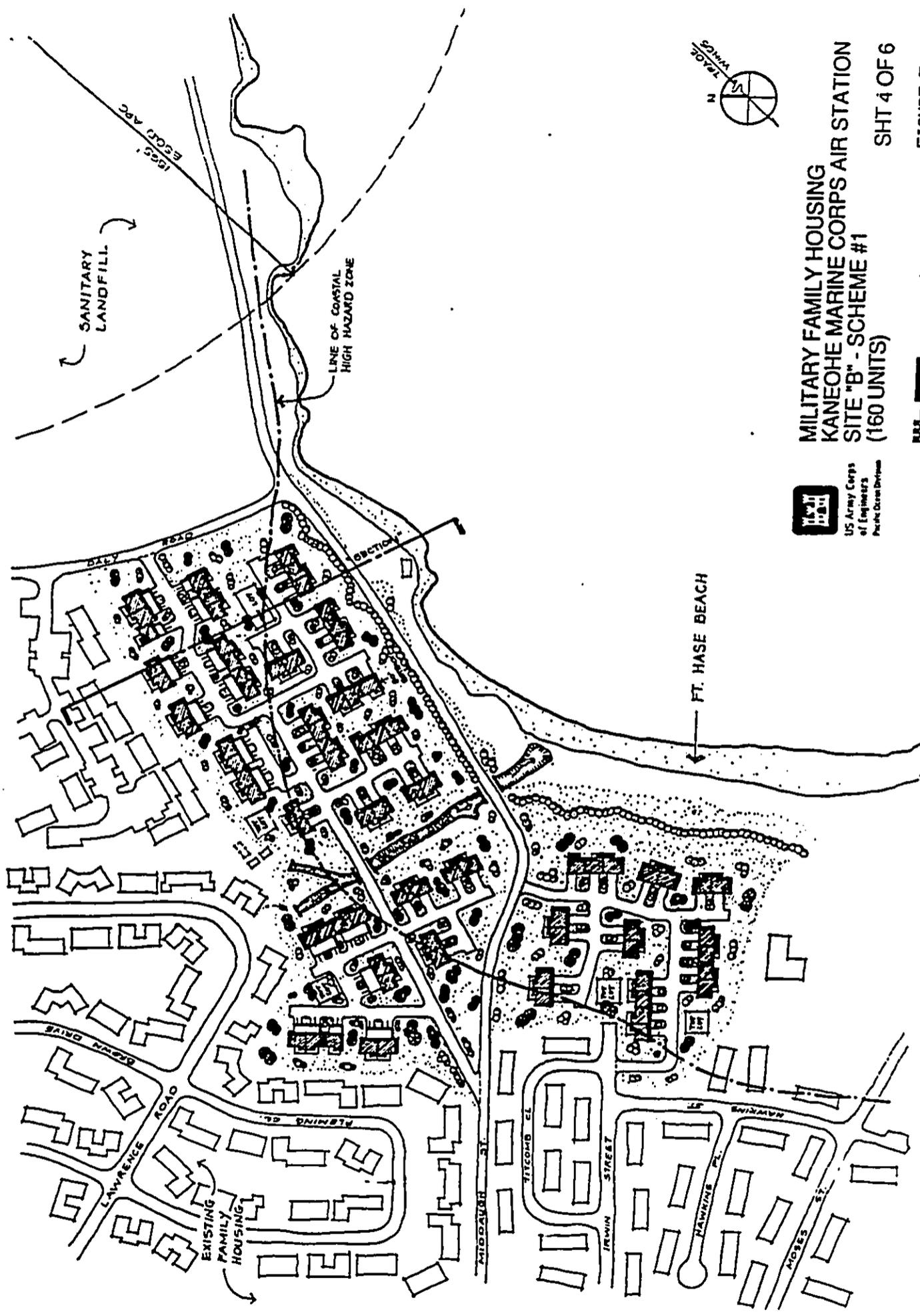


FIGURE 6



MILITARY FAMILY HOUSING
 KANEOHE MARINE CORPS AIR STATION
 SITE "B" - SCHEME #1
 (160 UNITS)

US Army Corps of Engineers
 Pacific District Office

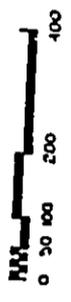
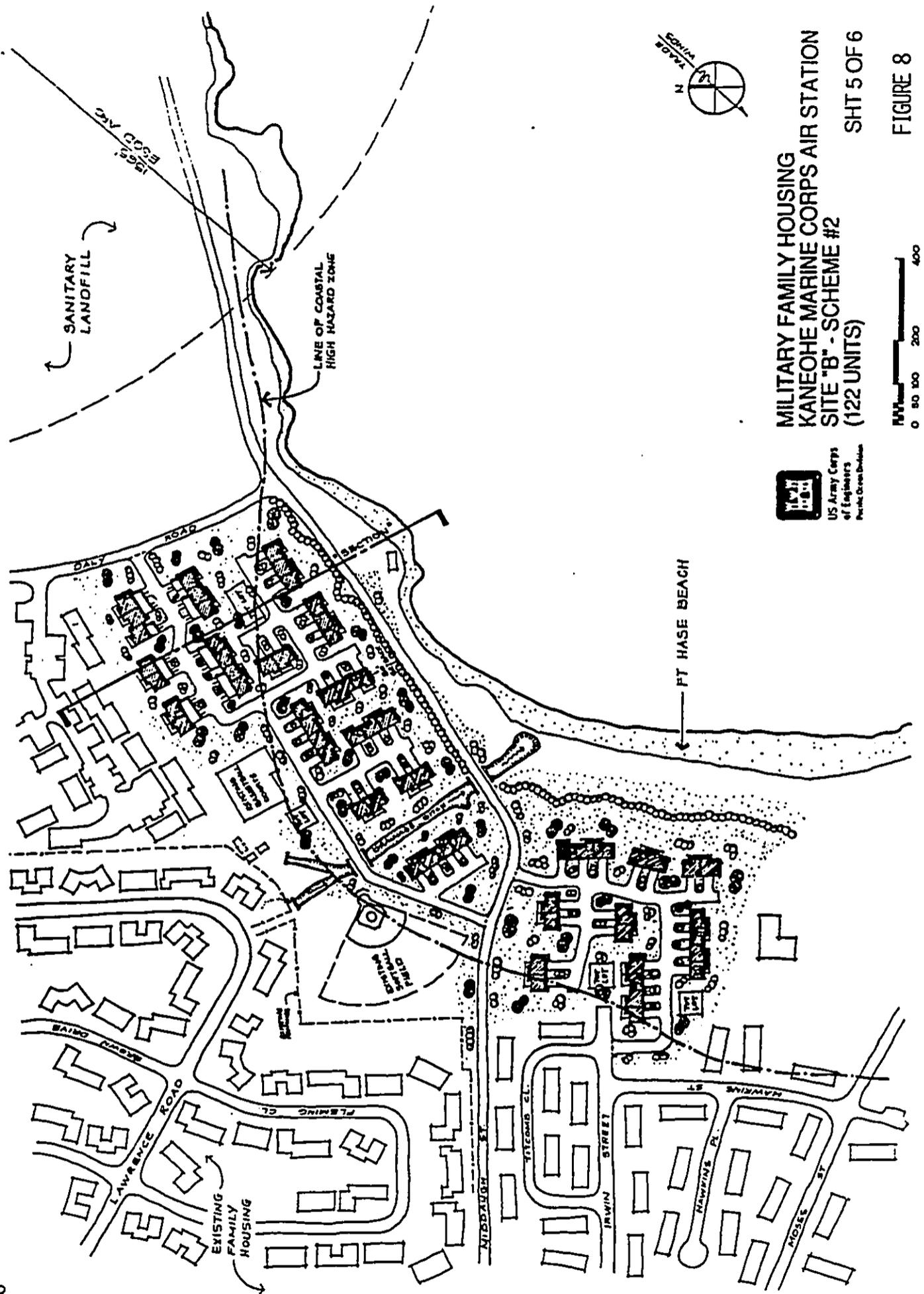


FIGURE 7

SHT 4 OF 6

FIGURE 7

FIGURE 8



**MILITARY FAMILY HOUSING
KANEOHE MARINE CORPS AIR STATION
SITE "B" - SCHEME #2
(122 UNITS)**

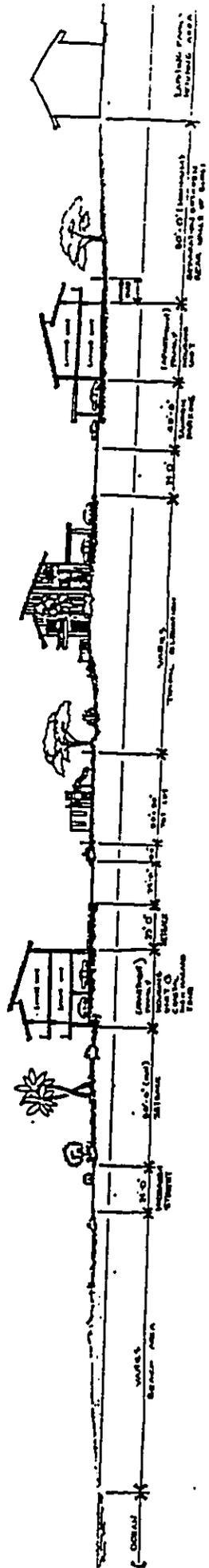
US Army Corps
of Engineers
Pacific Ocean Division

0 50 100 200 400

FIGURE 8

SHT 5 OF 6

FIGURE 9



MILITARY FAMILY HOUSING
KANEHOHE MARINE CORPS AIR STATION
ELEVATION/SECTION - SITE "B"
SHT 6 OF 6

FIGURE 9

DOCUMENT CAPTURED AS RECEIVED

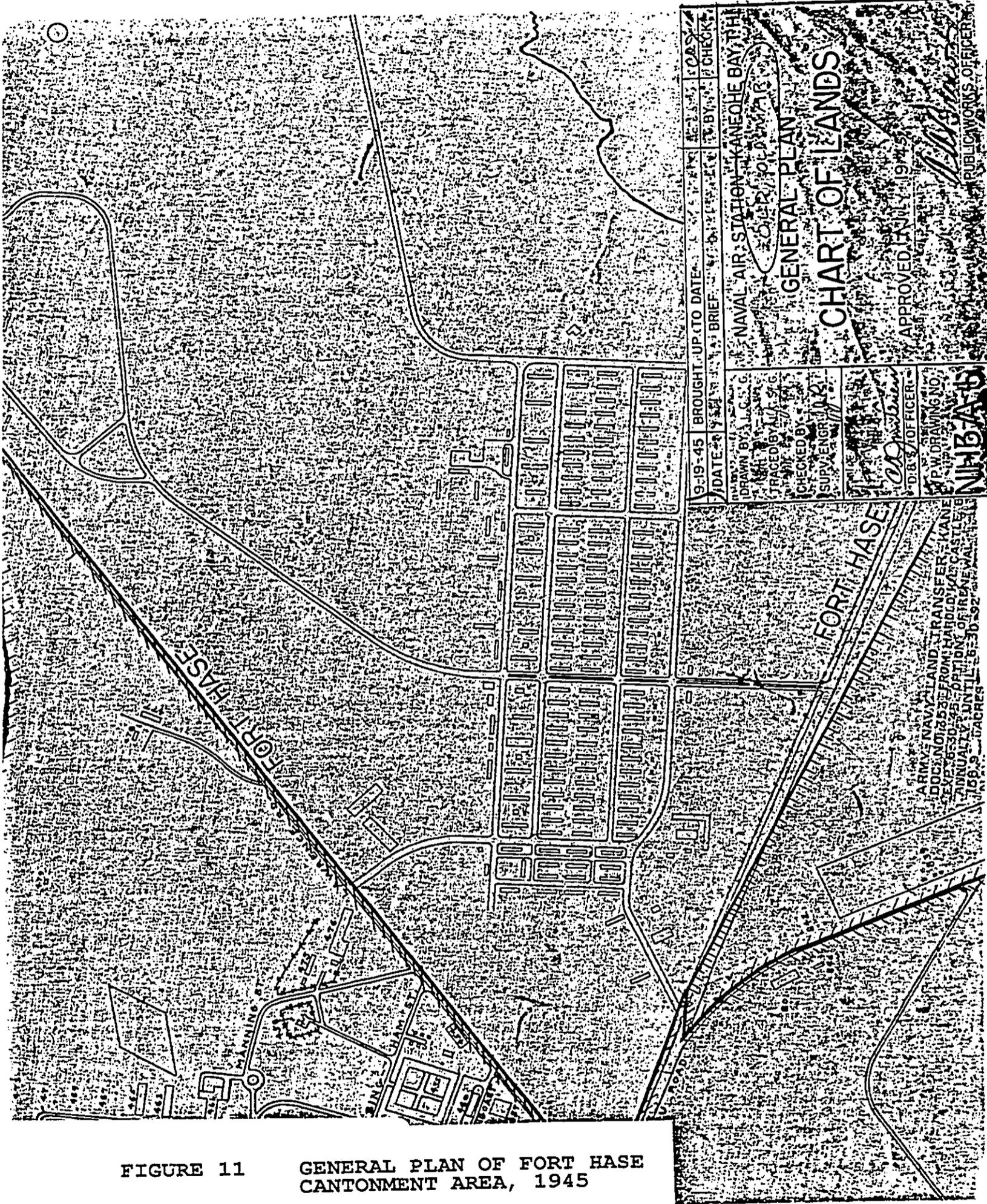


FIGURE 11 GENERAL PLAN OF FORT HASE CANTONMENT AREA, 1945

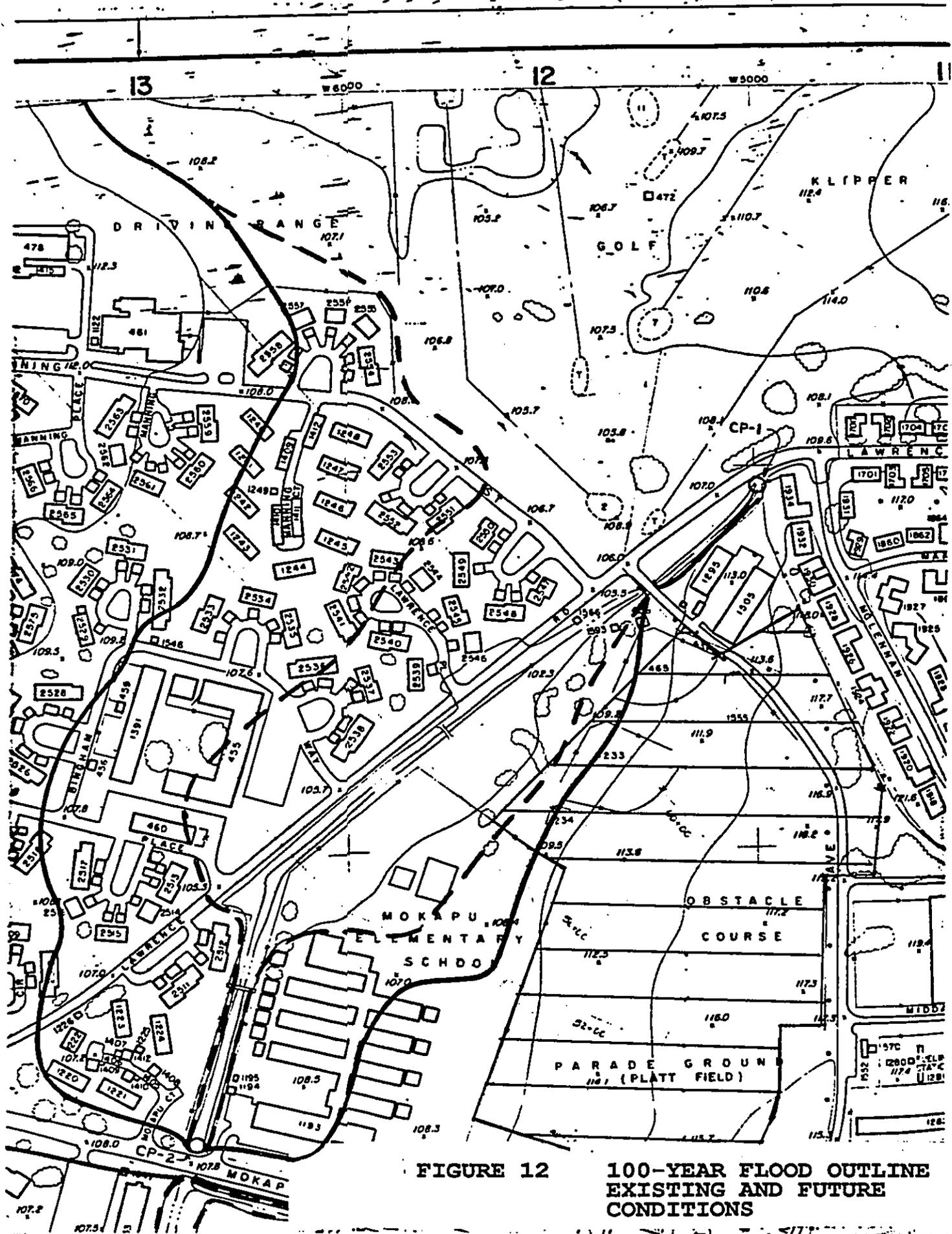


FIGURE 12 100-YEAR FLOOD OUTLINE EXISTING AND FUTURE CONDITIONS

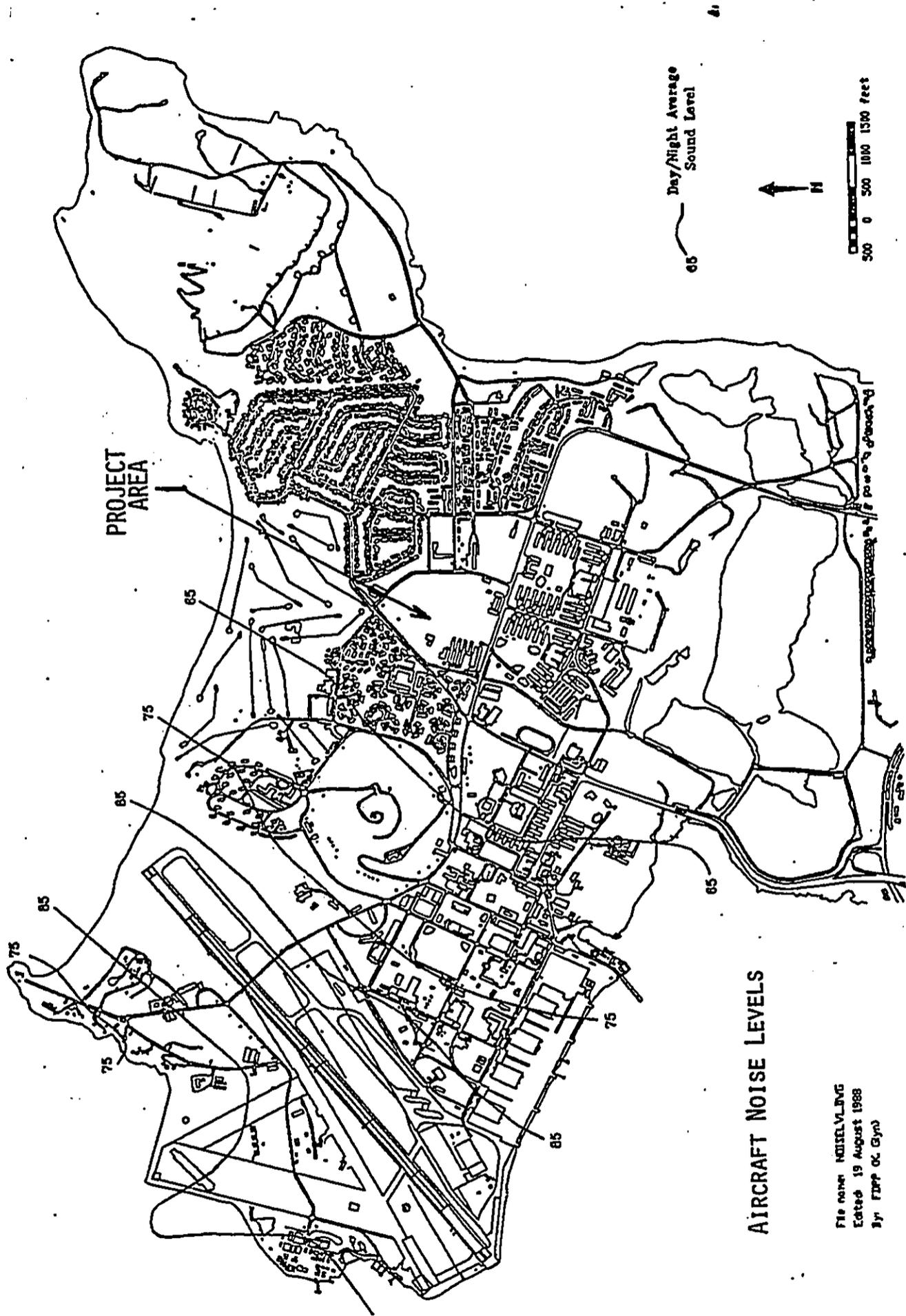
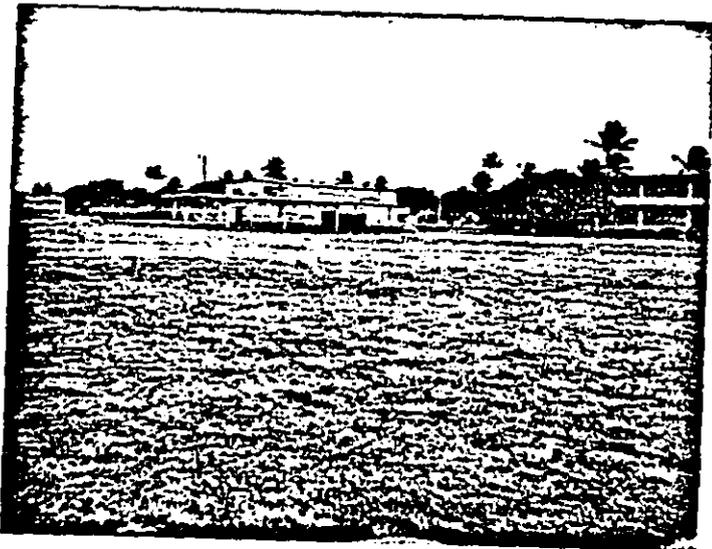


FIGURE 13

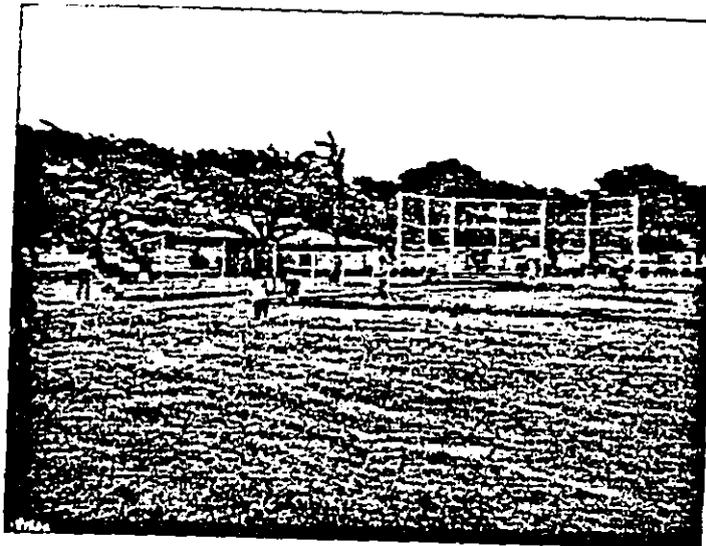
FIGURE 14 AIRCRAFT NOISE LEVELS

PHOTOGRAPHS



LOOKING SOUTHEASTWARD ACROSS PLATT FIELD
TOWARD BUILDING 1088 ON RIGHT AND
BUILDING 6036 (WORK IN PROGRESS)
ON LEFT.

PHOTO 1



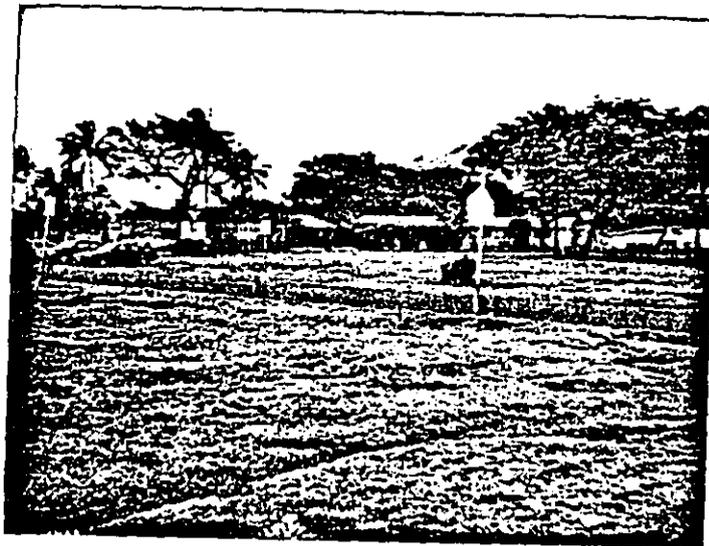
LOOKING NORTHWESTWARD ACROSS PLATT
FIELD TOWARD A SOFTBALL FIELD AND THE
NEW YOUTH CENTER

PHOTO 2



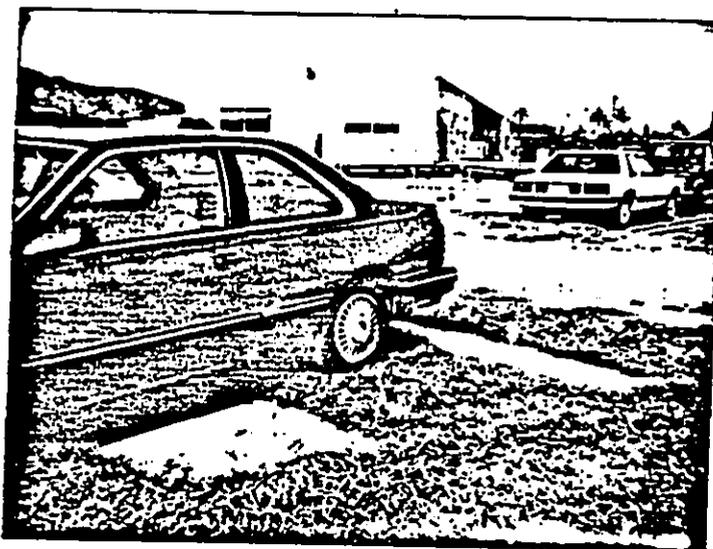
LOOKING NORTHWARD ACROSS PLATT FIELD
AT THE OBSTACLE COURSE AND OTHER BALL
FIELDS

PHOTO 3



LOOKING NORTHEASTWARD ACROSS CUSHMAN
AVENUE AT ONLY CLUMPS OF TREES AT
PROPOSED SITE.

PHOTO 4



LOOKING EAST FROM PRATT FIELD, MCASKB
TOWARD BUILDING 1282. TWO CONCRETE
RECTANGLES BELIEVED TO BE CAPPED
MOTOR GASOLINE STORAGE TANKS,
PROBABLY WORLD WAR II ERA.

PHOTO 5

APPENDIX A
COORDINATION LETTERS



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858-5440

September 4, 1990

REPLY TO
ATTENTION OF

Installation Support Branch
Military Division

Mr. William Paty
Chairperson and State Historic Preservation Officer
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Paty:

The Honolulu Engineer District, U.S. Army Corps of Engineers, has initiated archaeological intensive survey at the proposed Section 802 Family Housing project area, Kaneohe Marine Corps Air Station, Island of Oahu, Hawaii, in fulfillment of Section 110 (a)(2) of the National Historic Preservation Act of 1966, as amended. A portion of the proposed project area falls within the installation's historic preservation management boundaries of Archaeological Zone 2, which is suspected to contain significant historic properties. A copy of the Scope of Work for determining the presence or absence of these subsurface properties has been transmitted under separate cover to Ms. Carol Kawachi, Archaeologist, of your Historic Sites staff.

The Corps will, upon completion of the final archaeological report, consult with you again to assess the potential effects of the proposed family housing project on any historic properties found within the area. This consultation will be in accordance with the provisions of 36 CFR 800 of the President's Advisory Council on Historic Preservation.

If there is any need for additional information, please contact Mr. Charles Streck, Jr., Archaeologist, CEPOD-ED-MI, at 438-1489/6934.

Sincerely,


Kisuk Cheung
Director of Engineering

Attachment A



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858-5440

October 10, 1990

REPLY TO
ATTENTION OF

Installation Support Branch
Military Division

Mr. William Paty
Chairperson and State Historic Preservation Officer
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

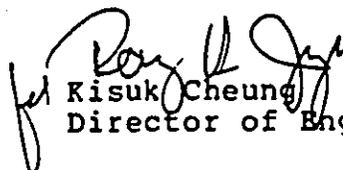
Dear Mr. Paty:

The Honolulu Engineer District, U.S. Army Corps of Engineers, has completed an archaeological intensive survey at the proposed Section 802 Family Housing Project Area, Kaneohe Marine Corps Air Station, Island of Oahu, Hawaii, in partial fulfillment of Section 110 (a)(2) of the National Historic Preservation Act of 1966, as amended. An End-of-Fieldwork letter report from our contractor, Archaeological Associates Oceania, indicated that thirty-two (32) backhoe trenches within the project area contained no subsurface cultural deposits (Enclosure).

In advance of receiving the draft and final summary reports for review and comment as well as to formally complete agency consultation with the provisions of 36 CFR 800 of the President's Advisory Council on Historic Preservation, the Corps requests your concurrence in a provisional determination of No Effect for the Section 802 Family Housing project.

If there is any further need for additional information, please contact Mr. Charles Streck, Jr., Senior Archaeologist, CEPOD-ED-MI, at 438-1489/6934.

Sincerely,


Kisuk Cheung
Director of Engineering

Enclosure

archaeological associates oceania

P.O. Box 150
Kaneohe, Hawaii 96744

Archaeological Consultants
Telephone: (808) 235-2531

September 14, 1990

US Army Engineer Division, Pacific Ocean
Corps of Engineers
Building 230, Room 221B
ATTN.: CEPOD-ED-MI, Contract Archaeology Monitor
Fort Shafter, Hawaii 96858-5440

**SUBJECT: End of Fieldwork Letter Report-Archaeological Subsurface
Investigations for Proposed Family Housing Construction, Kaneohe
Marine Corps Air Station, Mokapu, Koolaupoko District, Island of
Oahu, Hawaii. Contract Number DACA83-90-C-0062**

Sir:

The fieldwork for the subject project has been completed. The work was undertaken on August 15-31, 1990. Two hundred and twenty eight (228) hours were expended in conducting the fieldwork with a two-person crew.

Thirty-two (32) backhoe trenches were excavated down to the coralline, tuff, or basalt substrate. The trenches varied in length from 10 to 25 feet (3 to 7 meters). The width of the trenches was 25 inches, or 69 centimeters, the width of the backhoe bucket used for the excavations. The trenches were aligned along four transects, two across the width and two across the length of the project area. The excavation monitoring fieldwork included inspection of the excavated dirt, recording and photographing of trench stratigraphic profiles, and mapping of trench locations. A preliminary map showing the locations of the trenches numbered BT 1 to BT 32, is attached.

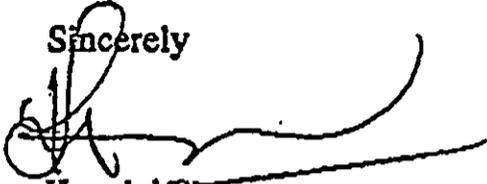
No cultural deposits were exposed in any of the trenches below the upmost recent historic period fill layers. Generally, the trenches exhibited the following stratigraphy: recent fill in the upper two or three layers, underlain by one or two layers of *in situ* developed soil matrices of moderate to strong structured clayey sediments, with the lowest layer consisting of impenetrable coralline or saprolitic basalt/tuff substrate.

The field method adopted is sufficiently adequate to test and expose any subsurface cultural deposit(s) in the project area. Based on our results, we conclude that no cultural resources are located within the project area and consequently, no further archaeological investigation is recommended in conjunction with the family housing construction.

enclosure to Attachment B

We will gladly answer any questions you may have concerning the project.

Sincerely



Kanalei Shun
Field Director

cc: Finance and Accounting Officer, US Army Engineer Division Pacific Ocean

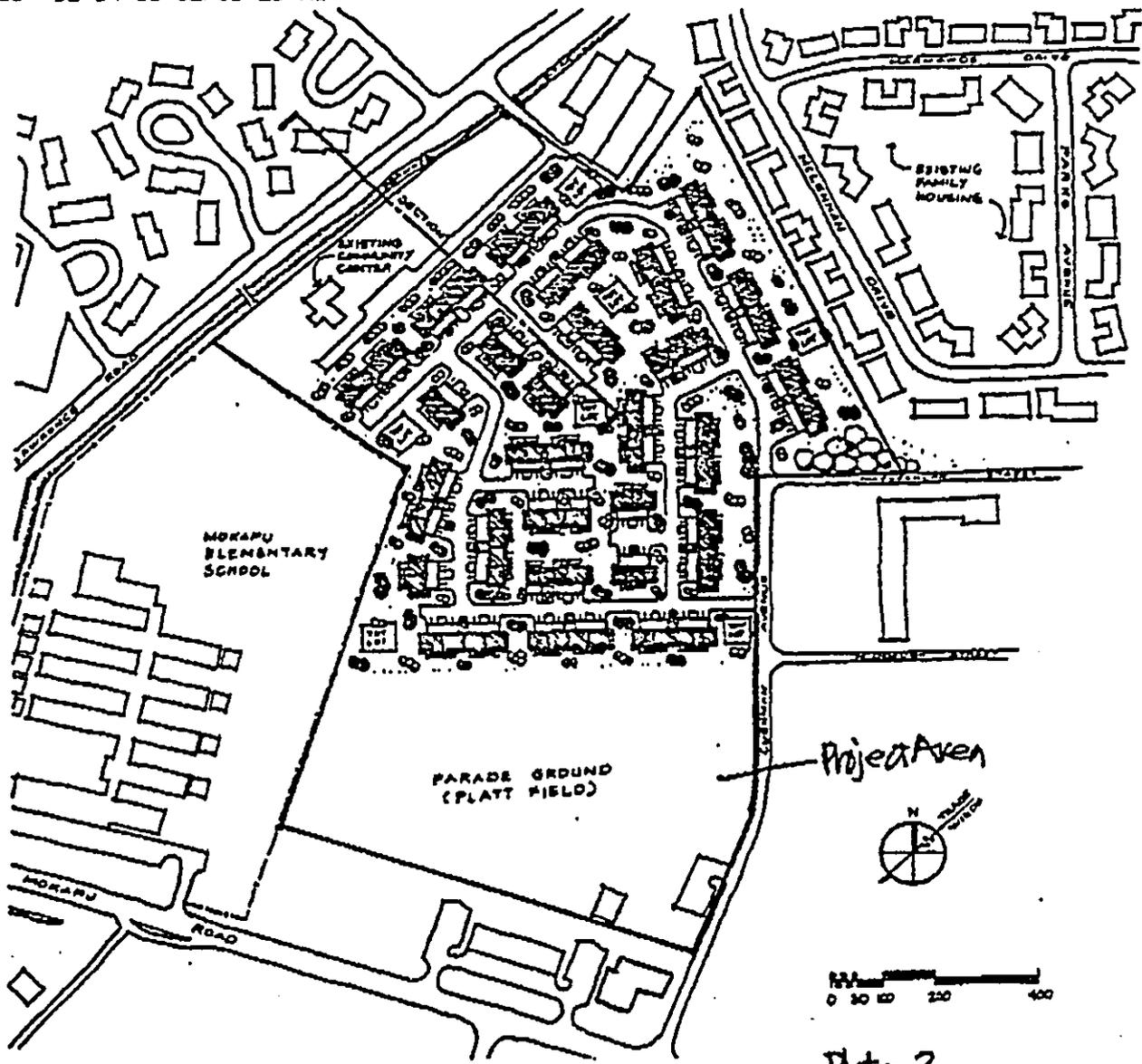


Plate 2

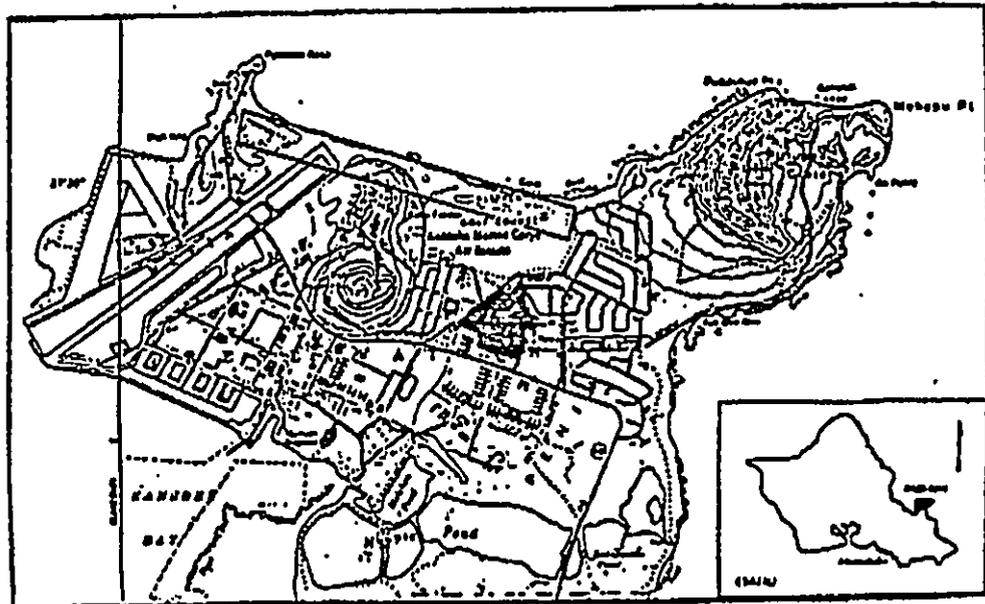


Plate 1



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858-5440

June 7 1990

REPLY TO
ATTENTION OF

Military Branch

Mr. Thomas Saka
Information Systems Services Branch
Office of Business Services
Department of Education
1390 Miller Street, Room 314
Honolulu, Hawaii 96814

Dear Mr. Saka:

This letter is to coordinate with the Department of Education a series of family housing projects that the U.S. Army Oahu Consolidated Family Housing Office is proposing for construction. Please inform us of various impacts that we should address in the environmental assessments (EA) being prepared for new projects described below.

Commencing in Fiscal Year (FY) 1991, the Army proposes to construct 276 two-bedroom dwelling units at the Marine Corps Air Station, Kaneohe Bay (MCASKB) which would be occupied in the 2nd Quarter (Qtr), FY 1993.

These units are in addition to a proposed FY90 40 unit project at MCASKB, which was previously coordinated with your office. That project consists of 12 two- and 28 three-bedroom units and would be occupied in the 3rd Qtr, FY1992.

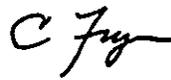
Other FY90 projects previously coordinated with you include a 90 unit project at Helemano Military Reservation (HMR) and a 20 unit project at Hickam Air Force Base, each planned for occupancy in the 3rd Qtr, FY 1992. The HMR project is part of the 600 unit project addressed in a Final Environmental Statement distributed in December 1989. Ten of the 90 units are in addition to the 600 units addressed in the EIS. The 90 unit project is a mix of 60 percent three-bedroom units and 40 percent four-bedroom units.

Attachment C

Additional Army Family Housing units are also proposed for construction on Oahu. Occupancy is planned for 22 units at Hickam Air Force Base (10 three-bedroom units, 12 two-bedroom units) and for the 116 units at Barbers Point Naval Air Station (280 three-bedroom units, 88 two-bedroom units), both in the 3rd Qtr, FY1993.

Point of contact for this action is Mr. David Sox, Environmental Assessment preparer (Telephone: 439-5030/ 1498) or Mr. Earl Nagasawa, Project Engineer (Telephone: 438-7510).

Sincerely



Clarence S. Fujii
Acting Director of Engineering

JOHN WAIHEE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

CHARLES T. TOGUCHI
SUPERINTENDENT

(H) 6

OFFICE OF THE SUPERINTENDENT

July 2, 1990

Mr. Clarence S. Fujii
Acting Director of Engineering
Department of the Army
Pacific Ocean Division, Corps of Engineers
Ft. Shafter, Hawaii 96858-5440

Dear Mr. Fujii:

Subject: Proposed Family Housing Projects
U.S. Army Oahu Consolidated Family Housing Office

This is in response to your letter dated June 7, 1990, to Mr. Thomas Saka of the Information Systems Services Branch of the Department of Education. Based on the proposed projects identified below, we have projected the following student enrollment impact:

<u>Project</u>	<u>Schools</u>	<u>Grades</u>	<u>Projected Students</u>
1) Kaneohe MCAS 276 2-BR Mid 1993	Mokapu Elementary Kailua Intermediate Kalaheo High	K-6 7-8 9-12	70-75 10-15 15-20
2) Kaneohe MCAS 12 2-BR 28 3-BR End 1992	Mokapu Elementary Kailua Intermediate Kalaheo High	K-6 7-8 9-12	10-15 2-3 3-4
3) Helemano MR 54 3-BR 36 4-BR End 1992	Helemano Elementary Wahiawa Intermediate Leilehua High	K-6 7-8 9-12	35-40 6-8 8-12
4) Hickam AFB 20 units End 1992	Mokulele Elementary Aliamanu Intermediate Radford High	K-6 7-8 9-12	4-8 1-2 1-2

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

Attachment D

Mr. Clarence S. Fujii

-2-

July 2, 1990

5) Hickam AFB 22 units End 1993	Mokulele Elementary	K-6	5-10
	Aliamanu Intermediate	7-8	1-2
	Radford High	9-12	1-2
6) Barbers Pt. NAS 116 units End 1993	Barbers Point Elem.	K-6	35-45
	Ilima Intermediate	7-8	8-12
	Campbell High	9-12	10-15

We offer the following comments on the impact of each of the project areas:

1) Kaneohe Marine Corps Air Station

Mokapu Elementary is currently operating beyond capacity with a large shortage of classrooms. The projected enrollment increase will require an additional five classrooms beyond the planned classroom building projected for September, 1992. Additional legislative funds will be required to accommodate the growth.

Kailua Intermediate and Kalaheo High should have adequate classroom facilities to accommodate the projected growth of the subject projects.

2) Helemano Military Reservation

Ten of the ninety housing units are additional units not originally addressed in a 1989 Environmental Impact Statement. The Department of Education has plans to construct a six-classroom building by September, 1991, and will program a second building in the six-year budget to accommodate additional enrollment growth.

The project will require additional classrooms at Helemano Elementary to meet the total enrollment increase of the Helemano housing project. The secondary schools should have adequate facilities for the projected growth.

3) Hickam Air Force Base

The proposed additional twenty-two units will have a minor impact on the schools in the attendance area. Mokulele Elementary may require an additional classroom to address the total enrollment increase of both projects.

Mr. Clarence S. Fujii

-3-

July 2, 1990

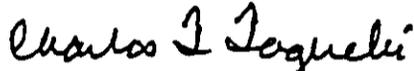
4) Barbers Point Naval Air Station

Barbers Point Elementary has the capacity to accommodate the projected growth from the 116-unit project. Ilima Intermediate and Campbell High Schools should have the capacity to absorb the added enrollment indicated above.

Thank you for allowing us to make comments on your proposed housing projects. Your continued cooperation is requested to keep us apprised of the latest developments in the construction of military houses. This will allow us to consider alternatives to accommodate the projected enrollment growth.

Should you have any questions, please call the Facilities Branch at 737-4743.

Sincerely,



Charles T. Toguchi
Superintendent

CTT:jl

cc: E. Imai
L. Viduya
L. Chung
S. Loo

APPENDIX B

ECONOMIC IMPACT FORECAST MODEL

U.S. ARMY CORPS OF ENGINEERS
 ENVIRONMENTAL TECHNICAL INFORMATION SYSTEM
Economic Impact Forecast System - Version 4.0

*** ON-BASE HOUSING CONSTRUCTION IMPACT FORECAST FOR
 SECTION 802 RENTAL GUARANTEE, MCAS KANEOHE BAY, HAWAII***

Export income multiplier:	2.3533	
Change in local		
Sales volume	Direct: \$7,947,000	
	Induced: \$10,754,000	
	Total: \$18,701,000	(0.152%)
Employment	Direct: 93	
	Total: 337	(0.074%)
Income	Direct: \$1,282,000	
	Total (place of work): \$7,001,000	(0.060%)
	Total (place of residence): \$7,001,000	(0.000%)
Local population	0	
Local off-base population	-687	
Number of school children	0	
Demand for housing	Rental: -177	
	Owner occupied: -99	
Government expenditures	-\$125,000	
Government revenues	\$174,000	
Net Government revenues	\$298,000	
Civilian employees expected to relocate:	0	
Military employees expected to relocate:	0	

SELECTED ECONOMIC IMPACT FORECAST SYSTEM (EIFS) VARIABLES

Default deflators: Updated to 1989.
Multipliers for Honolulu County: Calculated to 1982.

INPUT VALUES

Project name: Section 802 Rental Guarantee, MCAS Kaneohe Bay, Hawaii
Deflators: (EIFS default deflators were used)
 (price deflator for baseline year (ex b.v.)): 100.00
 (price deflator for output (ex b.v.)): 122.60
 (price deflator for baseline year (const)): 100.00
 (price deflator for output (const)): 120.50
Local expenditures for construction project: \$11,451,126 (calculated)
Non-local value entered: \$19,913,000
 (price deflator): 120.50
Percent for labor: 34.20%
Percent for materials: 57.80%
Percent of affected local construction workers
expected to relocate: 0.0%
Number of military families to move
on-post from local region: 276
Average income of affected military personnel: \$31,512
 (price deflator): 122.60



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858-5440

September 4, 1990

REPLY TO
ATTENTION OF

Installation Support Branch
Military Division

Mr. William Paty
Chairperson and State Historic Preservation Officer
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Paty:

The Honolulu Engineer District, U.S. Army Corps of Engineers, has initiated archaeological intensive survey at the proposed Section 802 Family Housing project area, Kaneohe Marine Corps Air Station, Island of Oahu, Hawaii, in fulfillment of Section 110 (a)(2) of the National Historic Preservation Act of 1966, as amended. A portion of the proposed project area falls within the installations's historic preservation management boundaries of Archaeological Zone 2, which is suspected to contain significant historic properties. A copy of the Scope of Work for determining the presence or absence of these subsurface properties has been transmitted under separate cover to Ms. Carol Kawachi, Archaeologist, of your Historic Sites staff.

The Corps will, upon completion of the final archaeological report, consult with you again to assess the potential effects of the proposed family housing project on any historic properties found within the area. This consultation will be in accordance with the provisions of 36 CFR 800 of the President's Advisory Council on Historic Preservation.

If there is any need for additional information, please contact Mr. Charles Streck, Jr., Archaeologist, CEPOD-ED-MI, at 438-1489/6934.

Sincerely,

A handwritten signature in cursive script, appearing to read "C. Cheung".

Kisuk Cheung
Director of Engineering

Attachment A



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858-5440

October 10, 1990

REPLY TO
ATTENTION OF

Installation Support Branch
Military Division

Mr. William Paty
Chairperson and State Historic Preservation Officer
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

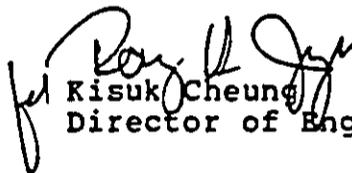
Dear Mr. Paty:

The Honolulu Engineer District, U.S. Army Corps of Engineers, has completed an archaeological intensive survey at the proposed Section 802 Family Housing Project Area, Kaneohe Marine Corps Air Station, Island of Oahu, Hawaii, in partial fulfillment of Section 110 (a)(2) of the National Historic Preservation Act of 1966, as amended. An End-of-Fieldwork letter report from our contractor, Archaeological Associates Oceania, indicated that thirty-two (32) backhoe trenches within the project area contained no subsurface cultural deposits (Enclosure).

In advance of receiving the draft and final summary reports for review and comment as well as to formally complete agency consultation with the provisions of 36 CFR 800 of the President's Advisory Council on Historic Preservation, the Corps requests your concurrence in a provisional determination of No Effect for the Section 802 Family Housing project.

If there is any further need for additional information, please contact Mr. Charles Streck, Jr., Senior Archaeologist, CEPOD-ED-MI, at 438-1489/6934.

Sincerely,


Risuk Cheung
Director of Engineering

Enclosure

archaeological associates oceania

P.O. Box 150
Kaneohe, Hawaii 96744

Archaeological Consultants
Telephone: (808) 235-2531

September 14, 1990

US Army Engineer Division, Pacific Ocean
Corps of Engineers
Building 230, Room 221B
ATTN.: CEPOD-ED-MI, Contract Archaeology Monitor
Fort Shafter, Hawaii 96858-5440

**SUBJECT: End of Fieldwork Letter Report-Archaeological Subsurface
Investigations for Proposed Family Housing Construction, Kaneohe
Marine Corps Air Station, Mokapu, Koolaupoko District, Island of
Oahu, Hawaii. Contact Number DACA83-90-C-0062**

Sir:

The fieldwork for the subject project has been completed. The work was undertaken on August 15-31, 1990. Two hundred and twenty eight (228) hours were expended in conducting the fieldwork with a two-person crew.

Thirty-two (32) backhoe trenches were excavated down to the coralline, tuff, or basalt substrate. The trenches varied in length from 10 to 25 feet (3 to 7 meters). The width of the trenches was 25 inches, or 69 centimeters, the width of the backhoe bucket used for the excavations. The trenches were aligned along four transects, two across the width and two across the length of the project area. The excavation monitoring fieldwork included inspection of the excavated dirt, recording and photographing of trench stratigraphic profiles, and mapping of trench locations. A preliminary map showing the locations of the trenches numbered BT 1 to BT 32, is attached.

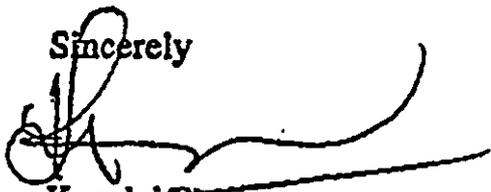
No cultural deposits were exposed in any of the trenches below the upmost recent historic period fill layers. Generally, the trenches exhibited the following stratigraphy: recent fill in the upper two or three layers, underlain by one or two layers of *in situ* developed soil matrices of moderate to strong structured clayey sediments, with the lowest layer consisting of impenetrable coralline or saprolitic basalt/tuff substrate.

The field method adopted is sufficiently adequate to test and expose any subsurface cultural deposit(s) in the project area. Based on our results, we conclude that no cultural resources are located within the project area and consequently, no further archaeological investigation is recommended in conjunction with the family housing construction.

enclosure to Attachment B

We will gladly answer any questions you may have concerning the project.

Sincerely

A handwritten signature in black ink, appearing to be 'Kanalei Shun', written over a horizontal line.

Kanalei Shun
Field Director

cc: Finance and Accounting Officer, US Army Engineer Division Pacific Ocean

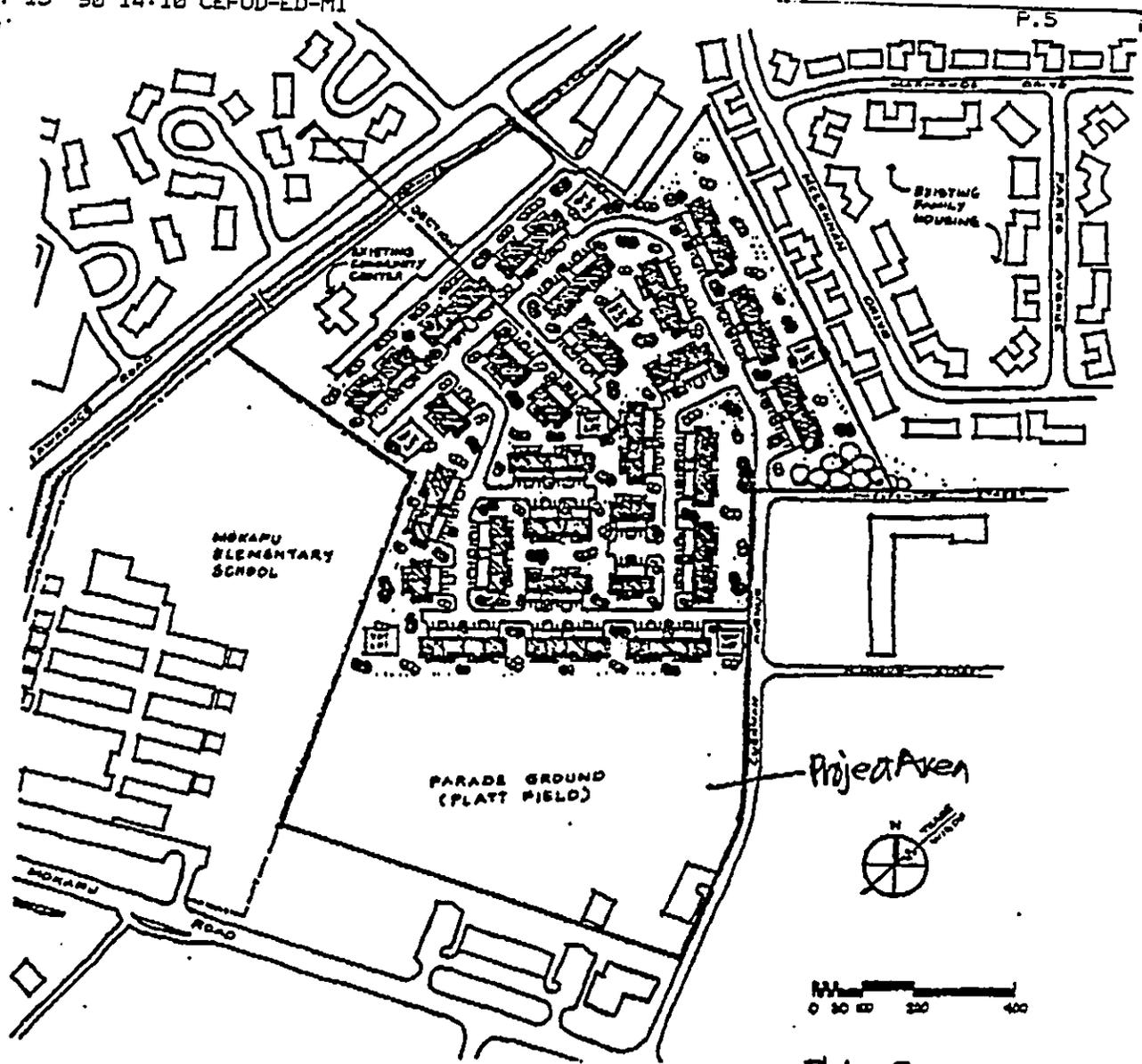


Plate 2

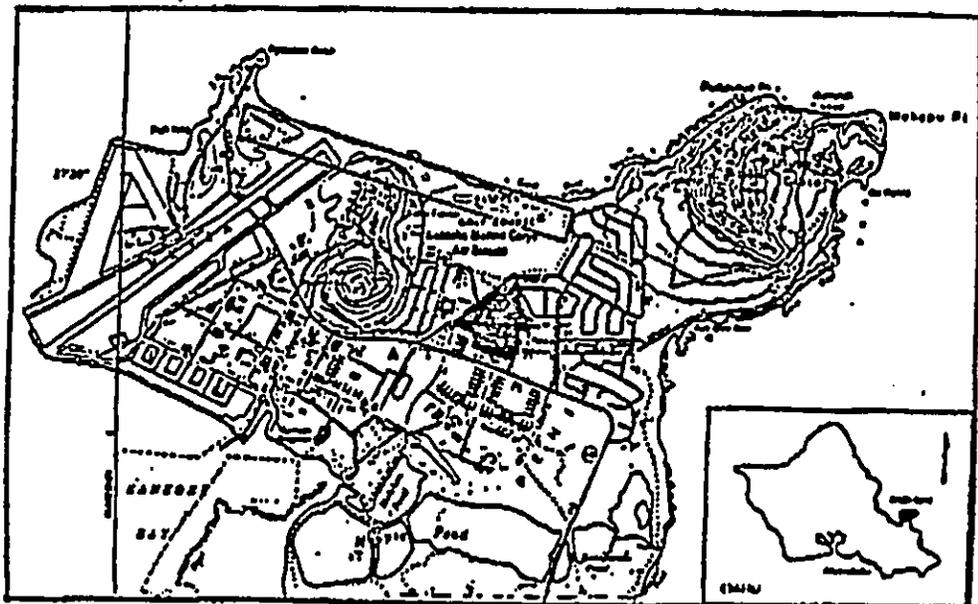
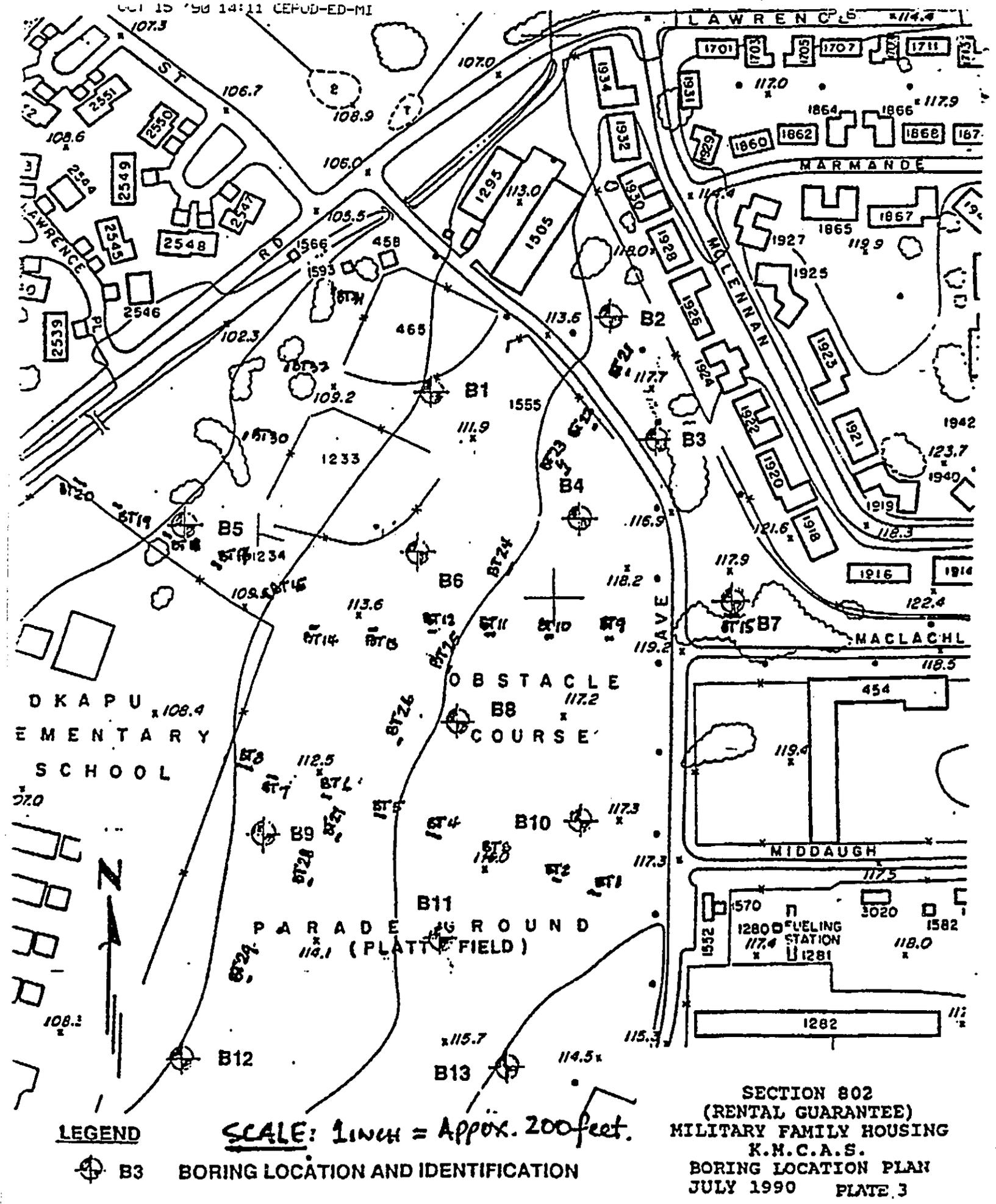


Plate 1



LEGEND

B3

BORING LOCATION AND IDENTIFICATION

SCALE: 1 inch = Approx. 200 feet.

**SECTION 802
(RENTAL GUARANTEED)
MILITARY FAMILY HOUSING
K.M.C.A.S.
BORING LOCATION PLAN
JULY 1990 PLATE 3**



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858-5440

June 7 1990

REPLY TO
ATTENTION OF

Military Branch

Mr. Thomas Saka
Information Systems Services Branch
Office of Business Services
Department of Education
1390 Miller Street, Room 314
Honolulu, Hawaii 96814

Dear Mr. Saka:

This letter is to coordinate with the Department of Education a series of family housing projects that the U.S. Army Oahu Consolidated Family Housing Office is proposing for construction. Please inform us of various impacts that we should address in the environmental assessments (EA) being prepared for new projects described below.

Commencing in Fiscal Year (FY) 1991, the Army proposes to construct 276 two-bedroom dwelling units at the Marine Corps Air Station, Kaneohe Bay (MCASKB) which would be occupied in the 2nd Quarter (Qtr), FY 1993.

These units are in addition to a proposed FY90 40 unit project at MCASKB, which was previously coordinated with your office. That project consists of 12 two- and 28 three-bedroom units and would be occupied in the 3rd Qtr, FY1992.

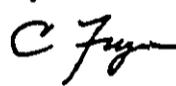
Other FY90 projects previously coordinated with you include a 90 unit project at Helemano Military Reservation (HMR) and a 20 unit project at Hickam Air Force Base, each planned for occupancy in the 3rd Qtr, FY 1992. The HMR project is part of the 600 unit project addressed in a Final Environmental Statement distributed in December 1989. Ten of the 90 units are in addition to the 600 units addressed in the EIS. The 90 unit project is a mix of 60 percent three-bedroom units and 40 percent four-bedroom units.

Attachment C

Additional Army Family Housing units are also proposed for construction on Oahu. Occupancy is planned for 22 units at Hickam Air Force Base (10 three-bedroom units, 12 two-bedroom units) and for the 116 units at Barbers Point Naval Air Station (280 three-bedroom units, 88 two-bedroom units), both in the 3rd Qtr, FY1993.

Point of contact for this action is Mr. David Sox, Environmental Assessment preparer (Telephone: 439-5030/ 1498) or Mr. Earl Nagasawa, Project Engineer (Telephone: 438-7510).

Sincerely



Clarence S. Fujii
Acting Director of Engineering

JOHN WAIHEE
GOVERNOR



CHARLES T. TOGUCHI
SUPERINTENDENT

(H)

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

July 2, 1990

Mr. Clarence S. Fujii
Acting Director of Engineering
Department of the Army
Pacific Ocean Division, Corps of Engineers
Ft. Shafter, Hawaii 96858-5440

Dear Mr. Fujii:

Subject: Proposed Family Housing Projects
U.S. Army Oahu Consolidated Family Housing Office

This is in response to your letter dated June 7, 1990, to Mr. Thomas Saka of the Information Systems Services Branch of the Department of Education. Based on the proposed projects identified below, we have projected the following student enrollment impact:

<u>Project</u>	<u>Schools</u>	<u>Grades</u>	<u>Projected Students</u>
1) Kaneohe MCAS 276 2-BR Mid 1993	Mokapu Elementary Kailua Intermediate Kalaheo High	K-6 7-8 9-12	70-75 10-15 15-20
2) Kaneohe MCAS 12 2-BR 28 3-BR End 1992	Mokapu Elementary Kailua Intermediate Kalaheo High	K-6 7-8 9-12	10-15 2-3 3-4
3) Helemano MR 54 3-BR 36 4-BR End 1992	Helemano Elementary Wahiawa Intermediate Leilehua High	K-6 7-8 9-12	35-40 6-8 8-12
4) Hickam AFB 20 units End 1992	Mokulele Elementary Aliamanu Intermediate Radford High	K-6 7-8 9-12	4-8 1-2 1-2

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

Attachment D

Mr. Clarence S. Fujii

-2-

July 2, 1990

5) Hickam AFB	Mokulele Elementary	K-6	5-10
22 units	Aliamanu Intermediate	7-8	1-2
End 1993	Radford High	9-12	1-2
6) Barbers Pt. NAS	Barbers Point Elem.	K-6	35-45
116 units	Ilima Intermediate	7-8	8-12
End 1993	Campbell High	9-12	10-15

We offer the following comments on the impact of each of the project areas:

1) Kaneohe Marine Corps Air Station

Mokapu Elementary is currently operating beyond capacity with a large shortage of classrooms. The projected enrollment increase will require an additional five classrooms beyond the planned classroom building projected for September, 1992. Additional legislative funds will be required to accommodate the growth.

Kailua Intermediate and Kalaheo High should have adequate classroom facilities to accommodate the projected growth of the subject projects.

2) Helemano Military Reservation

Ten of the ninety housing units are additional units not originally addressed in a 1989 Environmental Impact Statement. The Department of Education has plans to construct a six-classroom building by September, 1991, and will program a second building in the six-year budget to accommodate additional enrollment growth.

The project will require additional classrooms at Helemano Elementary to meet the total enrollment increase of the Helemano housing project. The secondary schools should have adequate facilities for the projected growth.

3) Hickam Air Force Base

The proposed additional twenty-two units will have a minor impact on the schools in the attendance area. Mokulele Elementary may require an additional classroom to address the total enrollment increase of both projects.

Mr. Clarence S. Fujii

-3-

July 2, 1990

4) Barbers Point Naval Air Station

Barbers Point Elementary has the capacity to accommodate the projected growth from the 116-unit project. Ilima Intermediate and Campbell High Schools should have the capacity to absorb the added enrollment indicated above.

Thank you for allowing us to make comments on your proposed housing projects. Your continued cooperation is requested to keep us apprised of the latest developments in the construction of military houses. This will allow us to consider alternatives to accommodate the projected enrollment growth.

Should you have any questions, please call the Facilities Branch at 737-4743.

Sincerely,

Charles T. Toguchi

Charles T. Toguchi
Superintendent

CTT:jl

cc: E. Imai
L. Viduya
L. Chung
S. Loo

February 20, 1991

Installation Support Branch
Military Division

Pacific Islands Administrator
Fish and Wildlife Service.
U.S. Department of the Interior
Box 50167
Honolulu, Hawaii 96850

Dear Sir:

The purpose of this letter is to comply with the requirements for consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act of 1973, as amended, and its implementing regulations, 50 CFR Part 402.

Enclosed is a copy of the Environmental Assessment (EA) and Finding of No Significant Impact (FNSI) for FY91, PN OCS0090 Section 802 (Rental Guarantee) Family Housing Project at Platt Field, Marine Corps Air Station, Kaneohe Bay, City and County of Honolulu, Hawaii. The EA and FNSI are in the final stages of approval. Subject to final approval of the FNSI, the project is not considered to be a "major construction activity" as defined by 50 CFR 402.02.

Based on the findings of the EA, specifically Section 3.7 (Pages 18-21), the proposed housing project and its associated sewer line upgrade, will not affect any Federally or State listed endangered or threatened species or critical habitat, either on the housing sites or in adjacent areas. Construction activities are expected to temporarily displace the American golden plover (*Pluvialis dominica*), which is protected under the Migratory Bird Treaty Act, but the project is not expected to result in any permanent or significant adverse effect to any feeding or nesting areas of the golden plover, or other birds or animals.

Your expeditious review of the enclosed materials and our finding of no effect would be appreciated.

Sincerely,

- Signed -

Clarence S. Fujii
Acting Director of Engineering



United States Department of the Interior

**FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS OFFICE**

P.O. BOX 50187
HONOLULU, HAWAII 96850

MI —

March 7, 1991

Mr. Clarence S. Fujii
Acting Director of Engineering
Attention: Installation Support Branch - Military Division
Pacific Ocean Division, Corps of Engineers
Fort Shafter, Hawaii 96858-5440

Dear Mr. Fujii:

This replies to your February 20, 1991 request for our comments relative to the proposed construction of the Family Housing Project at Platt Field, Marine Corps Air Station, Kaneohe Bay, Hawaii.

We concur with your determination that no listed or proposed endangered or threatened species of animals or plants will be affected by the project.

Thank you for the opportunity to review the proposal.

Sincerely yours,

William R. Kramer
Acting Field Office Supervisor
Pacific Islands Office

APPENDIX B

ECONOMIC IMPACT FORECAST MODEL

U.S. ARMY CORPS OF ENGINEERS
ENVIRONMENTAL TECHNICAL INFORMATION SYSTEM

Economic Impact Forecast System - Version 4.0

*** ON-BASE HOUSING CONSTRUCTION IMPACT FORECAST FOR
SECTION 802 RENTAL GUARANTEE, MCAS KANEOHE BAY, HAWAII***

Export income multiplier:	2.3533	
Change in local		
Sales volume	Direct:	\$7,947,000
	Induced:	\$10,754,000
	Total:	\$18,701,000
		(0.152%)
Employment	Direct:	93
	Total:	337
		(0.074%)
Income	Direct:	\$1,282,000
	Total (place of work):	\$7,001,000
	Total (place of residence):	\$7,001,000
		(0.060%)
Local population		0
		(0.000%)
Local off-base population		-687
Number of school children		0
Demand for housing	Rental:	-177
	Owner occupied:	-99
Government expenditures.....		-\$125,000
Government revenues		\$174,000
Net Government revenues		\$298,000
Civilian employees expected to relocate:		0
Military employees expected to relocate:		0

SELECTED ECONOMIC IMPACT FORECAST SYSTEM (EIFS) VARIABLES

Default deflators: Updated to 1989.

Multipliers for Honolulu County: Calculated to 1982.

INPUT VALUES

Project name: Section 802 Rental Guarantee, MCAS Kaneohe Bay, Hawaii

Deflators: (EIFS default deflators were used)

(price deflator for baseline year (ex b.v.)): 100.00

(price deflator for output (ex b.v.)): 122.60

(price deflator for baseline year (const)): 100.00

(price deflator for output (const)): 120.50

Local expenditures for construction project: \$11,451,126 (calculated)

Non-local value entered: \$19,913,000

(price deflator): 120.50

Percent for labor: 34.20%

Percent for materials: 57.80%

Percent of affected local construction workers

expected to relocate: 0.0%

Number of military families to move

on-post from local region: 276

Average income of affected military personnel: \$31,512

(price deflator): 122.60